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ABSTRACT

Designed to provide the reader with in-depth examinations of several key aspects of instructional development, this book presents both descriptions of state-of-the-art developments and analyses of problems faced by the field. These reports are presented in 13 chapters written by 17 authors: (1) "The Relationship between Faculty Development (FD), Organizational Development (OD), and Instructional Development (ID): Readiness for Instructional Innovation in Higher Education" (Allen J. Abedor, Steven G. Sachs); (2) "The Intricacies of Instructional Development" (Marvin E. Duncan); (3) "Strategies for Teaching and Learning Instructional Design" (Frank V. Colton); (4) "Comprehension and the Design of Instructional Materials" (Buford E. Wilson); (5) "Selection and Evaluation of Alternative Teaching Methods in Higher Education" (Dean N. Osterman); (6) "Cognitive Style Mapping: Its Place in Instructional Development" (Ronald K. Bass, James D. Hand); (7) "The Organization and Implementation of Instructional Development Programs in Higher Education" (Joseph J. Durzo); (8) "Instructional Improvement Centers in Higher Education" (Barry Bratton); (9) "Politics of Instructional Development in Higher Education" (Robin Edgar Lawrason); (10) "Economic Evaluation in/of Instructional Development" (Gene L. Wilkinson); (11) "Collective Bargaining: Adversary or Colleague" (Dennis R. Schaffer); (12) "The Challenge from Within: Some Unpopular Views on Instructional Development Topics" (Roberts A. Braden and William R. Terrell); and (13) "Instructional Development: The State of the Art" (Ronald K. Bass, Charles R. Dills, and D. Barry Lumsden). The text is supplemented by various tables and figures, and each chapter includes a bibliography. Author and subject indexes are also provided. (EW)

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INSTRUCTIONAL DEVELOPMENT: THE STATE OF THE ART

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INSTRUCTIONAL DEVELOPMENT:

THE STATE OF THE ART

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PREFACE

Growing interest in the emerging field of instructional development is evidenced at almost our every turn. Graduate programs designed for study of the field are growing in number. Membership in instructional development special interest groups is on the rise. Yet, materials which look into the heart of instructional development activities and call attention to what is really happening in the field are not readily available.

The purpose of this work is to provide step one toward a description of the state-of-the-art in instructional development. We, through selection of contributors to this work, have tried to provide a look at many factors which should be considered in the growth of the instructional development field, and varying points of view. There are other factors and other points of view which are equally important as we try to define ourselves. These factors, it is hoped, will be included in future works reporting on other aspects of Instructional Development – The State of The Art.

Ronald K. Bass
D. Barry Lumsden
Charles R. Dills

DEDICATION

To Jenny, our children, David, Ronda and Mark and our parents
R.K.B.

To Sharyn, Hans, and my two children, Gina and Danny
D.B.L.

To Rosemary, for her faith and encouragement
C.R.D.

INSTRUCTIONAL DEVELOPMENT:

THE STATE OF THE ART

CHAPTER I

THE RELATIONSHIP BETWEEN FACULTY DEVELOPMENT (FD), ORGANIZATIONAL DEVELOPMENT (OD) AND INSTRUCTIONAL DEVELOPMENT (ID): READINESS FOR INSTRUCTIONAL INNOVATION IN HIGHER EDUCATION

By

Allen J. Abedor
Steven G. Sachs

INTRODUCTION

During the past decade and particularly in the past few years, an increasing number of colleges and universities have established centers, agencies, or programs whose purpose is to help faculty improve their teaching. A study by Centra (1976) found over 700 institutions having such programs with over one-third of the programs less than two years old.

Several reasons for the rapid growth of these programs have been advanced. First, the emergence of educational technology as a field of specialization provided both personnel and tools to address the complex problems involved in improving learning and teaching. Second, many institutions, as a result of changing enrollment patterns, new clientele, shrinking resources, and burgeoning knowledge in the disciplines, realized that improvement of teaching was not a simple task. On the contrary, it remains an arduous task requiring a long-term institutional commitment of personnel and dollars (Davis, *et al.*, 1976; Gaff, 1975). Third, because of the general decline in the economy and resultant tightening of the academic job market, faculty are becoming far less mobile. With less turnover of faculty to stimulate new ideas and processes, the stimulation and renewal must come from within the institutions (Group for Human Development in Education, 1974). Fourth, enrollment in higher education has entered a period of continuous decline. Institutions must thus compete for a smaller number of students, or cultivate non-traditional populations. It is likely that improved instruction can provide a competitive advantage when recruiting potential students.

Due to the rapid growth of programs to improve teaching, a great deal of attention has been devoted to describing the activities of these programs, agencies, or centers. In the past few years, descriptions of the activities in such programs have been segmented into three discrete categories: Faculty Development (FD); Organizational Development (OD); and Instructional Development (ID). Briefly, FD activities focus on the knowledge, skills, sensitivities, and techniques of faculty members rather than the courses they teach. OD activities seek to change the structure, policies, and organizational environment in which instruction takes place. ID activities, on the other hand, focus on the systematic

design, development, implementation and evaluation of instructional materials, lessons, courses or curricula. A measure of the increased interest in these three categories of activities is reflected in the increasing number of publications, workshops, and jobs emphasizing FD, OD, ID or some combination of the three.

Assuming that FD, OD and ID are each involved in instructional improvement, what is their relationship to each other (e.g., are they independent, interactive, etc.)? Is there some sequence or hierarchy among the three? Must an instructional improvement program encompass all three?

This chapter attempts to answer these questions by showing that FD, OD and ID are integrally related to each other within the process of bringing about the adoption of an instructional innovation having the potential for improving teaching and learning. Conditions preceding the adoption of an innovation are critical to any short or long-term success. Therefore, both individual faculty members and their organizations must be made "ready" to develop and adopt an instructional innovation capable of improving instruction. "Readiness" for innovation, it will be shown, is created by FD and OD activities and is a major factor in determining whether ID activities are likely to create or modify an instructional innovation which will be acceptable within the teaching organization and still be capable of improving teaching and learning. Before discussing the FD, OD and ID relationship, however, some background information on the instructional innovation process will be helpful.

INSTRUCTIONAL INNOVATION

If instruction is to improve, something related to instruction must change. The instructional process or content must change, the faculty member's knowledge, skills, or attitudes must change, or the organizational environment must change. Instructional change implies a deviation from the status quo towards some instructional process or content perceived as new or different by those doing the changing. An instructional idea, technique, content, or process which is new to the adopting individual or group is defined as an instructional innovation. Thus, the term "instructional innovation" is a relative one since an idea or technique which is new to one faculty member or to one department may be old hat to another.

Instructional innovations may or may not be adopted in their original form. An innovation developed and used in one location is often modified to meet differing local conditions prior to its adoption in another location. For example, the Audio Tutorial (AT) system developed by Postlethwait, *et al.*, (1972) at Purdue University, has been used at

numerous universities, but in many cases not in its original form. Instead, modifications were made to accommodate differences in local facilities, equipment, curriculum, etc.

In other cases, a faculty member might choose to combine several existing innovations to create a unique solution to a particular instructional problem. Such would be the case if a faculty member examined the Audio Tutorial system and the Keller Plan of Individualized Mastery Learning (Keller, 1968) to meet a particular instructional need but found neither totally satisfactory. However, by combining elements of the AT system and the Keller Plan, the faculty member derives a new and unique solution. Such a modification of existing techniques is an innovation in its own right.

A systematic method for finding, modifying, or developing instructional innovations is found in the process known as Instructional Development. The ID process focuses on the systematic design, development, implementation, and evaluation of instructional materials, lessons, courses, or curricula in order to improve teaching and learning. To many practitioners of ID, this systematic process is defined in step-by-step models such as are found in Briggs (1970), Davis, *et al.*, (1974), Kemp (1971), and Silvern (1969) among others. These models epitomize the rational decision making process and are designed to produce effective and efficient instructional programs.

Finding, modifying or developing an instructional innovation, however, is only a part of the larger process of bringing about instructional change. It is also necessary that innovations be tolerated by the individuals and organizations who will use them. This chapter will focus solely on those situations in which individual faculty are free to make their own decisions regarding when to innovate and which innovations to adopt. In these situations, the organization does not adopt the innovation. Instead, the organization must merely accept or tolerate the individual's tryout and use of the innovation. At the very least, this means the organization does not totally prohibit or prevent the individual from innovating.

Numerous models of the process involved in adopting innovations have been proposed (for example: Davis, 1977; Havelock, 1969; Rogers and Agarwala-Rogers, 1976; Rogers and Shoemaker, 1971). While there are some differences among these models with regard to the exact nature and progression of the steps involved in an individual's deciding to either adopt or reject an innovation, all of the models imply that there are two broad stages in the process. The first stage centers on readiness or preparation for innovation and involves such events as becoming aware of potentially useful innovations, identifying problems these innovations might solve, seeking information about the innovations and

obtaining organizational acceptance of innovation and change in general. The second broad stage centers on involvement with a particular innovation. This stage encompasses such activities as development or modification of an innovation to fit local needs, tryout of the particular innovation, seeking confirmation from other faculty on the innovative decision made and obtaining organizational acceptance for the specific innovation to be adopted. In sum, it might be said that both the individual faculty member and his organization must concur that a particular instructional innovation is a worthwhile enterprise, or the use of the innovation is likely to be short lived.

It is recognized that adoption of an instructional innovation is no guarantee that instruction will improve in either efficiency or effectiveness. Some innovations, after their adoption, may negatively affect student learning, attitudes, or performance; and furthermore, they may decrease faculty morale or overtax the instructional budget. Nevertheless, the adoption of any innovation requires attention to the two stages of the adoption process, Readiness and Involvement. The concept of Readiness for Innovation is pivotal in understanding the relationship between FD, OD and ID. The next section therefore explores several dimensions of the concept of Readiness for Innovation.

READINESS FOR INNOVATION

Individuals and organizations are complex entities; each has a number of characteristics which can affect the adoption of an instructional innovation.

Readiness for instructional innovation can be defined as that critical combination of characteristics prerequisite to the adoption of an innovation which changes instructional content or process. This critical combination of prerequisite characteristics can be compared to the concept of critical mass in atomic physics. A nuclear reaction will not take place until all the necessary elements are present in certain amounts; this combination of physical elements is known as the critical mass. By analogy, in an instructional situation, a combination of prerequisite characteristics must be present or the adoption of a particular innovation is unlikely to take place. However, since not all instructional innovations are identical, the value of the critical combination of prerequisite characteristics is dependent upon the nature of the innovation. The greater the change in the status quo resulting from the innovation, the greater the combination of prerequisite characteristics (or level of readiness) required.

In the instructional innovation setting, unlike physics, there is no set formula specifying the combination of characteristics which precisely defines the critical combination needed for the adoption of an innovation. However, the literature on the innovation process clearly

indicates that there are two broad classes of characteristics which create this critical combination of prerequisites: individual characteristics and organizational characteristics. (See Sachs, 1976, 1977, for descriptions of a study which confirms the importance of these two classes of characteristics for innovation in higher education.) A combination of individual characteristics (such as attitudes, values and skills) contributes to the readiness of an individual for innovation. A combination of organizational characteristics (such as structure, rewards and norms) contributes to the readiness of the organization for innovation. *It is the sum of individual faculty readiness and organizational readiness which provides the critical combination of characteristics prerequisite to the adoption of a particular innovation.*

As it has been pointed out, there is no single set value for the critical combination of prerequisite characteristics that applies to all instructional innovations. Instead, a higher level of readiness is required for adoption of innovations which are radical changes from the existing method of doing things than for innovations which are small variations from the status quo. For example, the conversion of a traditional lecture course to self-instructional audiovisual modules is a much more radical change than the inclusion of overhead transparencies in one or two lectures to help teach some particularly difficult concept. Therefore, a higher level of readiness would be needed for the conversion to the audiovisual modules.

Rogers and Shoemaker (1971) provide a framework which can be used to determine the relative degree of readiness required for particular innovations. They identify five characteristics of innovations that can affect the adoption decision. These characteristics are:

1. The relative advantage of the innovation compared to the existing practice.
2. The compatibility of the innovation with the existing practice.
3. The complexity of the innovation.
4. The ability to try out the innovation prior to full scale adoption.
5. The ability to observe the results of the innovation which shows it to be an improvement over the existing practice.

From these characteristics, it follows that innovations requiring more radical change generally have less obvious relative advantages (given the amount of effort required for implementation), are less compatible, are more complex, are less amenable to tryout, and have fewer observable results.

Continuing with the previous example, the overhead transparencies for teaching a difficult concept could quickly provide clear evidence of improved learning without a major change in the course and would be easier to try than the self-instructional audiovisual modules. Thus, the use of transparencies, as an innovation, requires a lower level of readiness than does the use of AV modules.

If, through ID, an innovation has been identified, modified or developed for which an insufficient level of readiness exists in a particular individual or organization, it is unlikely that the innovation will be adopted by that individual or accepted by that organization. What might be likely to happen in this case is: (1) the innovation would be modified (made less innovative) so as to fit the existing level of readiness; (2) the innovation might be adopted but not integrated with existing practice, therefore having little long-term effect; or (3) the innovation would not be adopted in any form.

If the use of a modified innovation proved successful, it is possible that readiness would increase as a result of this successful experience. Furthermore, as the current teaching methods became less traditional and more innovative, there would be a less drastic difference between the status quo and other innovations. This spiral process of continually increasing readiness through a series of small but successful innovations should ultimately result in a higher level of readiness.

Having discussed the concepts of readiness and prerequisite characteristics in general, attention will now focus on the dimensions of individual and organizational readiness.

INDIVIDUAL READINESS

Individual faculty readiness is a variable defined as a combination of characteristics which influence an individual's decision to innovate. The idea of a number of factors combining to influence an individual's decision is not new, having appeared in algebraic models describing human decision making and in information integration theory (Anderson, 1974a, 1974b).

The characteristics which appear most potent in affecting variability in individual readiness for instructional innovation include the following:

1. **ATTITUDES**, which are positive toward self, teaching and change.
2. **VALUES**, which place importance on teaching and student learning.
3. **BELIEFS**, that instructional improvement is possible and worthwhile.
4. **SKILLS**, in organizing and delivering information.
5. **KNOWLEDGE**, of subject matter, innovations, and teaching methods and strategies.

Each of these five characteristics acts like a filter for the individual – letting some information in, keeping some information out, distorting other information.

How would one recognize a faculty member who was ready to adopt an instructional innovation? At this point in time, a functional measurement model does not exist which can assess the combined influence of individual characteristics on an individual's decision to innovate. However, unless an individual possesses some minimal value of each of the above characteristics, it is unlikely that he will attempt to innovate since that void would act as a strong blocking force to innovation. It is possible, though, that a small "deficit" in one characteristic can be compensated for by an "excess" of another characteristic. For example, if a faculty member values research over teaching (low value on teaching) then it is unlikely he or she would innovate unless some other characteristic compensated, such as a strong belief that the improvement of teaching would result in a desirable payoff such as more time for research. However, the critical combination of prerequisite characteristics also requires readiness in the organization to which the individual belongs and into which the innovation will be adopted.

ORGANIZATIONAL READINESS

Organizational readiness is a variable defined as a combination of characteristics which influence the acceptance or tolerance of an innovation in the organization. These organizational characteristics combine with individual characteristics to form the critical combination of prerequisite characteristics necessary for the adoption of an instructional innovation.

The idea of a number of characteristics interacting to influence organizational decision making has been suggested by several writers including Hage (1974) and Rogers and Agarwala-Rogers (1976). The characteristics which appear most potent in affecting variability in organizational readiness to innovate include the following:

1. **STRUCTURE,** which allows open and free communication and group problem solving.
2. **REWARDS,** for teaching or related activities.
3. **NORMS,** that support innovation.
4. **RESOURCES,** to support innovation.
5. **POLICIES,** that permit trial of innovations.

Unless the structure permits open and free communication, there will be resistance to the innovation because faculty are not aware of potential benefits and have inaccurate information about it. Or, if the norms do not support innovation in general, the introduction of innovations is

likely to be controlled by a few senior faculty acting as gatekeepers. The existence of restrictive policies and/or lack of resources are likely to constrain acceptance of instructional innovations. Lack of rewards for teaching-related activities will probably have a negative influence on faculty who otherwise might explore instructional innovations.

The effect of the interaction of these five characteristics is to create an organizational climate which influences, either positively or negatively, the adoption of an instructional innovation by one or more of its members. If the organizational influence is positive, it can be said that the organization "accepts" a member's innovation. If the influence is negative, it "rejects" a member's innovation.

How does one recognize an organization which is ready to accept an innovation? Again, at this point in time, a functional measurement model does not exist which can accurately assess the combined influence of each of the above characteristics to ascertain an organization's particular level of readiness.

As with individuals, it is also possible that a small "deficit" in one organizational characteristic can be compensated for by an "excess' in another. For example, a restrictive organizational policy requiring that all instructional changes be approved by a curriculum committee may be overcome or changed by faculty norms supporting innovations and an open structure which allows the faculty to exert pressure consistent with those norms.

The next section describes how individual faculty and organizational characteristics contribute to the overall level of readiness and how this level of readiness influences the nature of the innovation which is likely to be adopted.

THE OVERALL LEVEL OF READINESS

The overall level of readiness is the total combination of prerequisites, composed of the individual faculty and organizational characteristics, which must be present to facilitate the adoption of a particular innovation. If there is not a sufficient level of readiness, then that particular innovation must be modified to be adopted. That is, innovations most likely to be adopted and used on a long-term basis are those which only create changes consistent with the existing level of readiness. This relationship is illustrated in Figures 1, 2, and 3 where the *hypothetical* level of readiness necessary for different degrees of change from the status quo and the actual level of readiness are shown along the vertical axis, and the levels of individual faculty and organizational readiness and the contribution to readiness made by each characteristic are shown by the bar graphs.

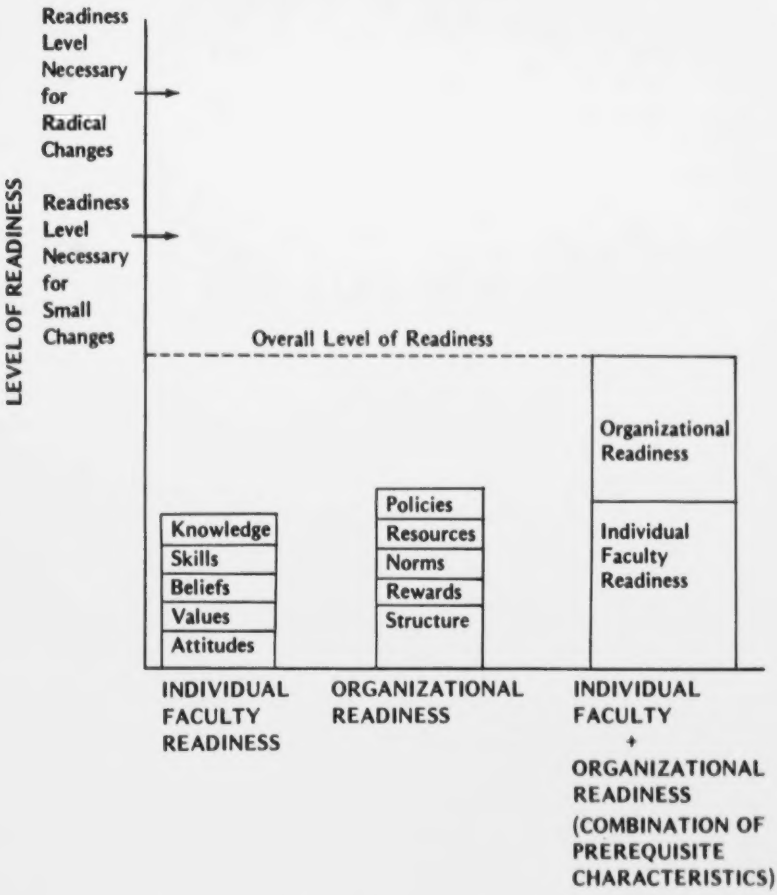

Figure 1. Readiness Profile: Unlikely to Innovate

Figure 1 illustrates a case where innovation of any type is unlikely. The values of the variables Individual Readiness and Organizational Readiness do not form the overall level of readiness needed for the adoption of innovations regarded as a small change from the status quo. Looking more carefully at Figure 1, the individual faculty's values, beliefs, and knowledge contribute very little to overall readiness and there is not sufficient compensation by the other two characteristics. Such an individual might be typified by a recent Ph.D. who feels positively about teaching, has read books to develop instructional skills, but is relatively inexperienced in the course to be taught. Furthermore, he values research more than teaching because he believes research will receive greater rewards than will teaching.

The faculty member's department in Figure 1 appears to be moderately supportive of change, though its resources do not contribute much to readiness. This situation is typical of many departments that have an open structure along with rewards, norms and policies that do not overtly restrict instructional innovation, but do not overtly encourage innovation either. In sum, Figure 1 shows a situation in which the adoption of an innovation would only be possible if the individual or the organization or both were more ready or, in other words, if there was a higher overall level of readiness.

Figure 2 illustrates a case in which there is a sufficient overall level of readiness for innovations that are radical changes from the status quo. The individual in this situation has positive attitudes and values toward teaching, and firmly believes that improving teaching is worthwhile and possible. This individual has a strong foundation of skills and knowledge with which to analyze and organize the course's subject matter.

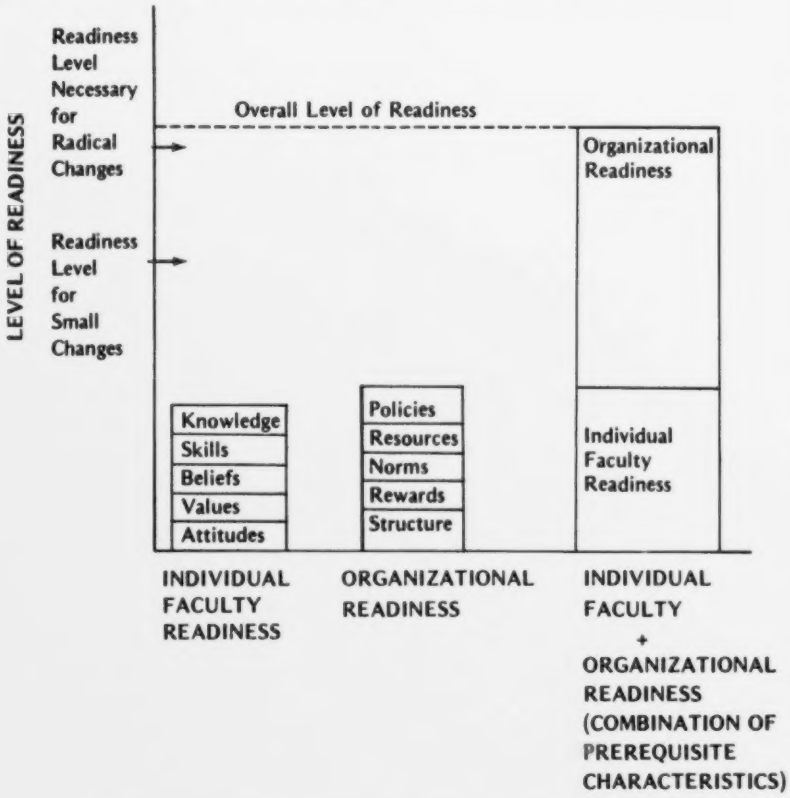

Figure 2. Readiness Profile: Ready for Drastic Change

The department depicted in Figure 2 appears to be strongly supportive of innovation in every respect except perhaps policies. These policies may reflect somewhat restrictive university or college policies, though even at that, these policies may be sufficiently flexible to permit trial of some innovations. The high contribution to readiness provided by the rewards, norms and resources of this department probably encourages the individual to undertake a larger scale innovation than might otherwise be indicated by the individual's values and attitudes. This is an example of how the various characteristics can compensate for each other.

In the final case, which is illustrated in Figure 3, there is a sufficient overall level of readiness for some innovations but not for others.

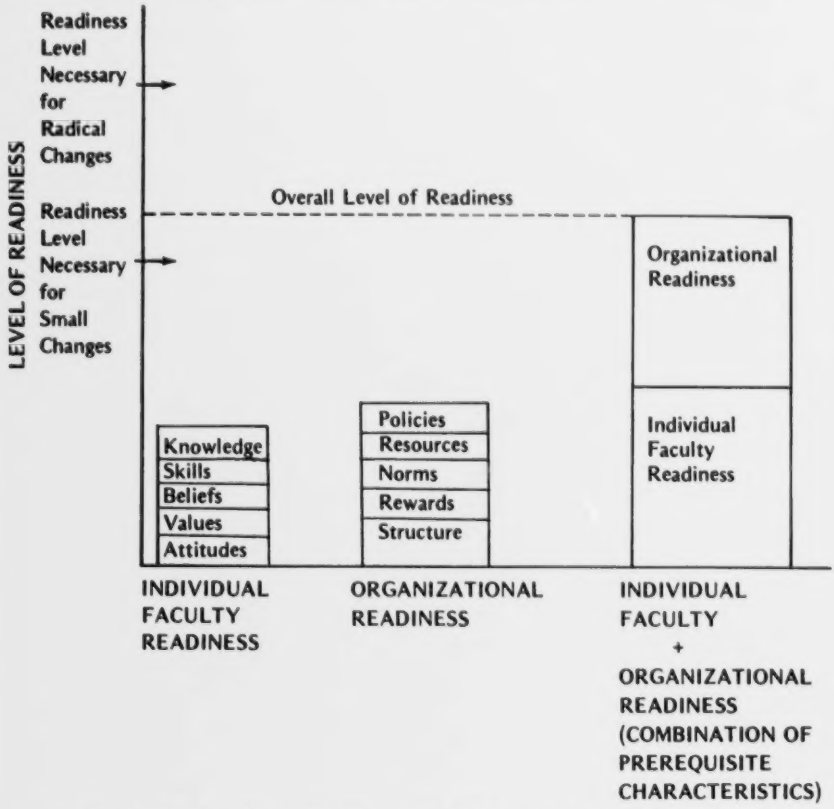

Figure 3. Readiness Profile: Ready for Some Change

In this situation, it would be necessary to carefully assess the nature of the innovation which might be considered and to focus on those which required less radical changes, therefore requiring less readiness. A less radical innovation may not let the faculty member achieve the same goals as the more radical innovation. However, if too radical an innovation is selected, it might not be adopted which also means the initial goals would not be achieved. Successful experience with a selected innovation might then improve the individual's attitudes toward change, beliefs, and instructional skills. This success might even cause the individual to place greater value on teaching. The effect of these changes would be to increase the individual's level of readiness.

These three examples illustrate the relationship of variations in the level of readiness to the nature of innovations likely to be adopted. While some degree of innovation is usually possible, what if the level of readiness is too low for a particular innovation? What can be done to make the adoption of that innovation more likely? The next section will show that it is possible to *increase* Individual Faculty Readiness and Organizational Readiness through Faculty Development (FD) and Organizational Development (OD) activities.

RELATIONSHIP OF FD AND OD TO READINESS

Previous sections of this chapter have suggested that teaching and learning can be improved if an appropriate instructional innovation is adopted by individual faculty and accepted by their organization. In order for the innovation to be adopted successfully, both the individual and organization must be ready. It was pointed out that if a sufficient overall level of readiness did not exist for a particular innovation, that innovation would either be modified to fit the level of readiness that did exist or would not be adopted at all. If the modified innovation is adopted and is successful, readiness is likely to increase. Then, through adoption of several of these less radical innovations, overall readiness could be increased.

For example, if there was not a sufficient level of readiness to support the adoption of Audio-Tutorial modularized instructional units (a fairly radical change from conventional lectures) a faculty member might be willing and able to adopt the innovation of a slide/tape program to substitute for a regular lecture. If this innovation proved successful, the faculty member would be likely to extend the use of slide/tape programs to other lectures. In this way, the individual and organization could eventually achieve a level of readiness which would support the original innovation, i.e., Audio-Tutorial modularized instructional units. However, there are more direct ways to increase individual faculty and organizational readiness. These ways involve the use of FD and OD.

Examining FD and OD programs suggests that some of their outcomes directly affect individual readiness and organizational readiness. This is not to say that the objectives of FD and OD programs are strictly to increase readiness. Rather, FD and OD are the *processes* through which readiness for innovation can be increased.

In *A Handbook for Faculty Development,* Berquist and Phillips (1977) state:

> An effective faculty development program often causes a faculty member to re-examine his own life goals and *values.* He may also try to improve his interpersonal skills and his ability to be creative and risk-taking in his design and execution of course programs.
>
> (p. 199) (Italics added)

Similarly, Freedman (1973) suggests that important consequences of faculty development are increased autonomy in accord with newly internalized *values* and goals; and Gaff (1975), in describing faculty development principles, indicates that such programs will have more impact if they emphasize changes in *attitudes, values, skills,* and sensitivities. (Italics added)

While recognizing that FD programs across the country can and do have a variety of outcomes, it is apparent that these outcomes affect those characteristics previously identified as components of Individual Faculty Readiness – attitudes, values, beliefs, skills and knowledge.

A comparable argument may be made for the relationship between Organizational Development and Organizational Readiness. Previously, it was pointed out that organizational readiness is influenced by the five characteristics: structure, rewards, norms, resources, and policies. In describing OD, Boyer and Crockett (1973) write in terms of structure, leadership and methods of organizational operation. Berquist and Phillips (1977) suggest that important foci for organizational development include departmental reorganization (structure), use of space and time (resources), and faculty reward system (rewards). Once again, while recognizing that OD programs across the country have a diversity of planned outcomes, these outcomes nevertheless affect the characteristics which define the organizational readiness.

It should be emphasized that while FD and OD both influence Individual and Organizational Readiness, FD and OD need not occur in any particular sequence with respect to each other. Instead, FD and OD are probably symbiotic – each reinforcing and stimulating the other. For example, a department may have been involved in a self-study of its organization and policies (OD). As a result of this study, faculty clearly expressed frustration with excessive teaching loads due to an open enrollment policy. This frustration led to an increase in faculty

interest in making their instruction more efficient. To address this interest, faculty attended workshops on alternative teaching strategies (FD). As a result of these workshops, their readiness for adoption of instructional innovation was increased. In addition, the increase in individual faculty readiness stimulated additional OD activities, in this case, a study of the allocation of resources in the department. In this way, FD and OD interact to stimulate each other.

In sum, an important outcome of FD and OD activities is an increase in the level of readiness. The actual adoption of the innovation, however, requires more than just readiness as it is also necessary for all parties to become involved with the innovation. During this involvement stage, ID is an important event.

RELATIONSHIP OF ID TO FD AND OD

ID is defined as a systematic process for selecting, adapting or creating (e.g., developing) an instructional innovation having the potential for improving teaching or learning. As a process, ID is usually considered to focus on the development of the instructional innovation itself (e.g., new method of teaching) rather than on the larger instructional innovation process including readiness to innovate. ID models, in fact, reveal a surprising paucity of information relating to the antecedent conditions necessary for successful implementation of the process. Twelve popular ID models reviewed by Stamas (1972, 1973) contained virtually no provision for either assessing or creating individual or organizational readiness for instructional change. These models apparently either assume that necessary readiness has been achieved prior to beginning ID activities or else simply ignore the concept of readiness altogether.

Therefore, ID may be dependent on FD and OD activities to produce the level of readiness necessary for a particular innovation. If that innovation is successful, readiness increases slightly and makes adoption of a second, more radical innovation more likely. To ensure an adequate level of readiness for the second innovation, additional FD and OD may also be employed, etc.

This spiral relationship can be seen in the case of a faculty member who achieved a high level of readiness through such activities as attending presentations at professional meetings, visiting with innovative colleagues at another university, and participating in several workshops held by the university's instructional improvement agency. Also, the faculty member's department reorganized following the chairman's retirement and was sufficiently open and supportive to accept a modest degree of instructional innovation; and it even provided a meager budget to support the production of instructional materials. The result was an overall

level of readiness appropriate for the development and use of three instructional innovations: self-graded student quizzes using the latent image technique (to allow students to get frequent and immediate feedback on their progress in the class); a training program prior to the start of classes for all graduate teaching assistants involved with the course; and a detailed set of course objectives including statements of criteria and standards. Admittedly, in their initial form these innovations were not elaborate, although assistance from ID personnel was necessary for their development. During the term, the faculty member noticed marked improvements on exams and fewer complaints about the graduate assistants. This information was communicated informally to his colleagues. Having experienced a modicum of success, the instructor began to explore other things which could be done in the course. After consultation with ID specialists, it was agreed that the mastery model would be the next innovation developed. However, the organization did not appear sufficiently ready to accept this level of change nor did the faculty member himself possess sufficient skills to implement this innovation. Therefore, the faculty member did some readings on the topic and attended a workshop on mastery instruction sponsored by the instructional improvement agency. Then, in collaboration with ID personnel, he held a departmental seminar on mastery instruction to gain acceptance of this innovation. Due to this instructor's predilections and departmental resistance, a pure mastery model was not adopted. Instead, a modification which was locally acceptable was developed. Since then, other instructors in that department have expressed an interest in trying some new things in their courses, also.

Did FD and OD precede ID? Did ID precede FD and OD? It is hard to tell since it depends on which innovation is being considered. In any event, FD and OD activities such as workshops for the department and individual faculty, travel and departmental reorganization, contributed to readiness for innovation. The success of the innovations produced by the ID process also contributed to the readiness needed for additional innovation. Therefore, the innovation process flows in a spiral which links FD and OD to ID.

In sum, it is the faculty member who must ultimately select an innovation to improve teaching and learning. If the innovation selected requires a level of individual and organizational readiness which exceeds the existing level, then clearly FD and OD activities are warranted. If the faculty member selects an innovation for which he or she is ready, but for which the organization is not ready, there are three possible outcomes. First, the innovation may fail due to lack of departmental acceptance. Second, the innovation may be modified to conform with the department's existing level of readiness. Third, OD activities may

be conducted concurrently with ID activities to ensure acceptance of the innovation. On the other hand, a faculty member may select an innovation for which the existing level of organizational readiness is sufficient for immediate acceptance. In the latter case, the success of the innovation itself may stimulate additional readiness which will facilitate further innovation.

CONCLUSION

This chapter has addressed three questions regarding the relationship between FD, OD, and ID:

What is their relationship to each other?

Is there some sequence or hierarchy among the three?

Must an instructional improvement program encompass all three?

It was suggested that there is a spiral relationship between FD, OD, and ID. FD and OD can create readiness for the innovations produced by ID. In turn, success with these innovations creates some additional readiness for more radical innovations. Therefore, FD, OD, and ID each contributes to increasing the level of readiness which in turn allows more radical changes from the status quo.

This chapter also pointed out that FD and OD are not sequential, they are symbiotic. Each contributes to the level of readiness necessary for instructional innovation to occur. Furthermore, deficiencies in one or more characteristics of readiness may be compensated for by excesses in other characteristics.

Deciding whether an instructional improvement program must encompass FD, OD, and ID was more difficult to answer. In order for instructional innovation to occur there must be a particular level of readiness (formed by a combination of prerequisite characteristics) and different innovations require different levels of readiness depending on the degree of change involved. The more radical the change, the greater the level of readiness needed. Therefore, instructional improvement agencies may accept readiness as it exists (hopefully, above a threshold that allows minimal innovations) and only undertake innovations consistent with the pre-existing level of readiness. On the other hand, instructional improvement agencies may attempt to *increase* the level of readiness such that a greater degree of change becomes possible. The methods for accomplishing this increase are FD and OD. This leaves the choice of whether to encompass all three – FD, OD, and ID – up to the individual agency, depending on how it wishes to operate.

The perspective on the process of instructional improvement presented in this chapter will undoubtedly be controversial since there is little direct evidence to support or refute it; but hopefully, it will

stimulate a dialogue among professionals which can result in a better understanding of how FD, OD, and ID can be utilized to bring about the improvement of teaching and learning.

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CHAPTER II

THE INTRICACIES OF INSTRUCTIONAL DEVELOPMENT

By

Marvin E. Duncan

A vast storehouse of information is available for learning by students of all ages. Much of this information may be effectively learned in an environment far different from the school's traditional four walls. It has been found that as much as 85 per cent of the learning occurring in a course may result from interactions with sources other than the teacher (Smith and McAshan, 1964) and thus it is unquestionable that learning does occur outside of the classroom. Assuming that students will learn both "because of" and "in spite of" the teacher, it becomes of paramount importance for teachers to perform their assigned tasks competently in order to insure that the learning which occurs in the school learning environment is done efficiently and effectively. The question thus becomes: how do teachers best facilitate learning in a situation in which they control the parameters?

Parameters of learning in the classroom are usually controlled by teachers. Traditionally, a teacher's responsibility has been and continues to include the selection of course objectives, the selection of content, the selection of instructional techniques, and the selection of evaluative instruments. These selections not only shape the learning environment, but in so doing, force the student into a somewhat passive role in the learning process. This is not to suggest that learning cannot be passive. However, totally restricting learning to a passive mode means the total exclusion of the active role and therefore the reduction of the learning options.

The material to be learned constitutes a learning hierarchy. For example, what is learned earlier in time forms a foundation for what is to be learned later in time.

A learning hierarchy suggests the sequencing of instruction through the establishing of priorities. The financial control of educational institutions remains basically with state legislatures, and this control is being exercised less benevolently and more critically than in the decades of the recent past. Presently, pressure is being applied from various publics, who are asking that educators and the educational system be accountable to *someone* for *something*. University systems are attempting to identify

nonfunctional and duplicate programs in an effort to maximize the effectiveness with which funds are spent. Individual institutions within these systems are now being held accountable for the productivity of their instructional programs. As this emphasis upon accountability seeps down to the classroom teachers who act as managers of the learning environment, it becomes apparent that they must make every effort to insure that learning occurs at optimal levels.

Teacher expectations can serve as an external source of motivation for the learner. It cannot be overemphasized that the conditions under which the student attempts to learn are of great importance and should be given due consideration. Failure to consider the interaction of the environment within which learning is to occur with the material to be learned can lead to an unprofitable situation for both the learner and the teacher.

Apparently, what is needed in order to avoid this frustrating situation is a systematic process for designing, implementing, and evaluating the total instructional program. Such a process exists, and is called instructional development. Nonetheless, instructional development is not a panacea for all educational problems. Rather, it is a systematic process in which basic principles of teaching and learning are synthesized and applied to the classroom learning situation. The writer recognizes that one chapter cannot adequately explicate all of the components of the instructional development process. Thus, this presentation is selective in nature and is designed to provide insights with respect to: (1) an operational definition of the instructional development process, (2) the human dimensions of the process, (3) the use of graphic models in explaining the process, and (4) practical suggestions for the developer in implementing and diffusing the process. A summary and commentary are also provided.

DEFINITION: A CONCEPTIONAL FRAMEWORK

Much has been written about instructional development in recent years. Most writers appear to agree that instructional development is a process of systematically designing, sequencing, implementing, evaluating, and constantly monitoring instruction with the intent of improving its quality and effectiveness and thereby improving learning.

Hamreus (1971, pp. 2–3) discusses four characteristics which he contends must be carefully analyzed and put into proper perspective with respect to instructional development endeavors. These characteristics are: (1) goal definition, (2) goal relevance, (3) systematization, and (4) evaluation. Goal definition means that the goals of the system must be clearly defined. Goal relevance is the concept that instructional goals, although they may be clearly defined, serve no real purpose unless

they are directly related to the parameters of the educational system in which they are embedded. Systematization involves the concept that development efforts must proceed in a systematic way in order to achieve the intended goals. Evaluation connotes constant monitoring and assessing of instructional development efforts. Needless to say, the constant monitoring and assessing of development efforts is important if wise decisions are to be made in choosing among developmental alternatives. It thus appears that instructional development is inextricably bound to the notion of equifinality (Miller, 1965) since it affords means by which one can identify, in a systematic manner, various paths toward the goal of improving the quality of instruction and thus of learning.

Instructional development is often referred to as the systems approach. In fact, in the literature on the subject, the systems approach is sometimes defined in the same terms used to define instructional development. Confusion also abounds with respect to the definitions of instructional technology and educational technology. The systems approach, instructional development, instructional technology and educational technology, as referred to herein, are used interchangeably. Perhaps confusion over terminology may be attributed to the fact that individuals in technology come into the field from different philosophical and educational backgrounds (Thiagarajan, 1974). Instructional development is a system in the sense that system theories are basic to the development process. What, then, is a system? A system is an assemblage of components designed to function in an integrated fashion in order to achieve predetermined objectives. "The systems approach is a systematic attempt to coordinate all aspects of a problem toward the achievement of specific objectives" (Erickson and Curl, 1972), and is product oriented. The coordinated efforts include the use of all of the resources which the system has at its disposal. Utilization of all available resources implies the creation of a man-machine system. A man-machine system is a set of planned procedures in which man and machine capabilities are integrated in such a manner as to achieve results which man could not achieve alone. A man-machine system is a marriage of man and machines with increased efficiency and productivity as the off-springs. When applied in an educational setting, efficiency and productivity are measured in terms of learner outcomes. Similarly, as in a marriage, there should not be competition as to who will do what. In this type of system, man attempts to maximize the minimum, i.e., the resources, instead of minimizing the maximum. Technology is not exclusively machines nor exclusively men. Hoban (1965, p. 124) asserts that technology is a complex, integrated organization of men and machines, of ideas, of procedures, and of management.

As previously indicated, there have been numerous attempts to define instructional development. Don Ely (1973, p. 524) pointed out that the definition of educational technology will vary depending on the background of the person supplying the definitions and the individuals who interpret those definitions. He suggests further that it is most difficult to arrive at a definition to be agreed upon by a consensus of those in the field. Ely purports to seek conceptual agreements rather than identical statements of a definition of educational technology. The definition of instructional technology by the President's Commission on Instructional Technology (1970, p. 5) appears to have provided the basis for conceptual agreement with respect to a working definition of the process. The commission defines instructional technology as:

> . . . a systematic way of designing, carrying out, and evaluating the total process of learning and teaching in terms of specific objectives based on research in human learning and communication, and employing a combination of human and non-human resources to bring about more effective instruction.

This definition is an amalgamation of wordy attempts to define more explicitly the nature of instructional development. Instructional development then, is a process aimed at product development. The product is to be used by people. Witt (1971) notes that interpersonal relations and group dynamics are vitally important factors in group endeavors such as are most instructional development efforts. Gustafson concurs with Witt and writes:

> . . . the most important element of instructional development is people . . . people are its energy, its insight, its product and its consumer and to engage in instructional development is to change people. To ignore any segment of the population is to invite frustration and probable failure. (1971, pp. 6–7).

Devotees of the instructional development movement have not given enough attention to the human element of the process. Barson, Haney, and Lange (1966, pp. 358–71) stated in an article, "The Heuristic Dimension of Instructional Development," that the developer should stress the human element in an instructional system. Thus, the human element in the process should receive attention.

PEOPLE INVOLVEMENT

Few instructional development efforts are likely to involve only one person working with a faculty member. The consensus of professional opinion is that instructional development efforts should be a team process. One person is not likely to possess all of the skills and the knowledge needed in this systematic process. Individuals with competencies in the following areas should participate on the team: (1) curriculum, (2) communication, (3) learning theory or educational psychology,

(4) evaluation, (5) a content specialist, (6) a media specialist and (7) an instructional developer, who should coordinate and provide leadership for team activities. However, this view that instructional development should be a team process is not universally accepted. Stephen M. Faust (1974, pp. 12–15) notes that the team concept may inhibit rather than accelerate educational progress. He writes that teachers, especially college teachers, have time constraints imposed by teaching and research activities which they feel do not permit them to devote time to instructional development activities. Faust reported on a group of teachers who permitted an instructional developer to set course objectives, determine methods of evaluation and assume full responsibility for the design of learning materials, including curriculum construction. While this arrangement proved to be a workable solution for curriculum improvement in this situation, it is unlikely to have universal applicability. Teachers who "do not have time" for involvement in curriculum revision and curriculum improvement should remember that time is the only commodity on earth which is provided equally to all.

Ivor K. Davies (1977, p. 24) notes the importance of people in instructional development efforts when he writes:

> There are two views of Instructional Development around. There's the engineering view – the people who are in love with boxes and arrows – a view in which people rarely appear. It's so much easier to manipulate things and to forget that it's people we're advising, people we're working for, people who are at the heart of the very process to which we're devoting our life.

While people are important in instructional development activities, media centers in institutions which purport to be engaged in the instructional development process place undue emphasis on hardware. In an article, "Peopleware," Billy K. Rutherford (1976, p. 32) states that educational technology is perceived of as an expensive machine-oriented field. On site visits, he found that many media directors make it obvious to the observer that educational technology is hardware-oriented and that they talk almost exclusively about hardware. Rutherford further noted that few media directors mention the need for people. These observations lead to the conclusion that although the importance of hardware need not be de-emphasized, it should be thought of as an information dissemination channel, a channel which carries stimulus materials, rather than the central focus of the process.

People involvement also includes communicating effectively with administrators and teachers about the relative advantages of the instructional development process. Since the process is relatively new and considered an innovation, communicating the advantages of systematic planning to potential users is a necessity. This idea must be diffused before

one becomes immersed in actual development activities. Without full understanding of the nature of an innovation and a positive attitude toward it, an individual may temporarily adopt the innovation, but discontinuance, a form of rejection, may soon follow. Ultimately, as Lin, *et al.* noted (1966), "it is the degree of a teacher's attitudinal acceptance of a specific innovation which determines its adoption." Thus, an important factor to be considered in the process of innovation would be the attitudes which people possess about the innovation. Considering this statement and others that support this position, how then does one explain the instructional development process to potential adoptors with the goal of promoting its acceptance? The section which follows provides a gestalt view of the process which, when communicated to teachers and administrators, may reasonably be expected to generate understanding and acceptance.

EXPLAINING THE PROCESS

The explanation of an involved process is difficult. Explaining the instructional development process is no exception. The effective explanation of this process proceeds along two lines simultaneously, each line of explanation supporting and illuminating the other: (1) the use of graphic models which present the theoretical idea or process while, at the same time, illustrating the relationships which exist among component parts; (2) the statement of generalizations, interpretations and caveats which further illuminate the more subtle meanings which may not be readily apparent from the graphic models. The explanation of instructional development to follow will be presented along these lines.

Three models of instructional development systems follow: (1) Hamreus' mini-model – a condensed version; (2) Hamreus' mini-model – a six-stage version of the model; (3) Glaser's Basic Teaching Model.

MINI-MODEL: CONDENSED VERSION

Hamreus (1970, pp. 16–18) believes that the multiplicity of activities engaged in may be classified into three stages: (1) the definition stage, (2) the design stage, and (3) the development stage. Figure 1 is a representation of the condensed version of the mini-model.

Stage I. The preparatory stage is the stage concerned with the definition of the system. This includes the identification of needed resources, both human and nonhuman. This stage is frequently bypassed by many developers, who move directly into the design stage, thereby leaving the system definition to be stated implicitly through the design.

Stage II. Decisions are made in this stage regarding performance standards and material specifications. Constraints found in the environment within which the system is to function are identified and related

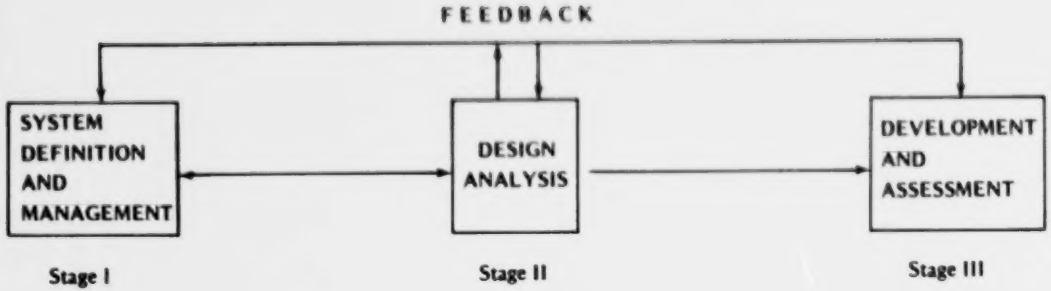

Figure 1. Major stages in a systems approach to instructional development.

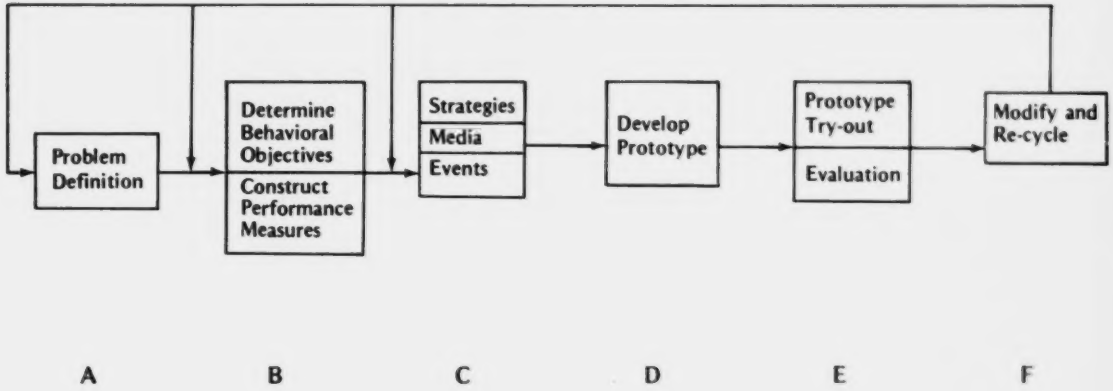

Figure 2. Mini-system flow diagram for developing instructional systems.

to these decisions.

Stage III. Development and assessment procedures are the concern in this stage. The prototype of the system is prepared including all necessary content, media and methods. The prototype is then evaluated in order to determine the extent to which the system has achieved its purpose. The model illustrated in Figure 1 is a condensed model, as previously indicated.

Figure 2 is a more detailed model illustrating the process. It consists of six components, including the three components included in Figure 1.

Box A is an examination of the problem, a systematic evaluation of the context in which the new system is to operate. Box A includes: (1) students and student characteristics; (2) the existing constraints (finance, physical facilities, personnel, materials); and (3) the people affected by the problem in addition to the students. This step incorporates the human dimension of the instructional development process.

Box B represents the construction of explicitly stated behavioral objectives upon which the remainder of the process is dependent. These objectives provide the basis for development of materials, for learning management, and for system evaluation. In this same step, tests are constructed based upon the objectives in order to determine whether or not students have attained the pre-determined outcomes specified in the objectives. Box E is particularly dependent upon these tests.

Box C illustrates three decision functions which occur at the same time. Strategy decisions are those related to the content selected, the sequence of the content, and how to present the content. Media decisions are aimed at selecting the most appropriate media to be used in presenting the content. These decisions interact to define the events. These events will produce the kinds of interactions desired between pupils, teachers and materials which will hopefully result in the objectives being met.

Box D represents the actual design of the instructional sequence. All materials to be used are gathered and decisions regarding the interweaving of these materials are made.

Box E presents the quality control function inherent in the systems approach to instructional design. The sequence is tried on a representative sample of students under conditions which realistically stimulate the final operating conditions. The evaluative aspect involves the use of the tests devised in Box B. A visual evaluation of students as the materials are being used can also be revealing.

Box F. Once data from the evaluation have been gathered, it is used to modify the system and correct system weaknesses. This process is cyclical in nature and occurs continually so that the efficiency of the

Figure 3. Basic Teaching Model.

system can be monitored. This is known as formative evaluation.

BASIC TEACHING MODEL

Glasser's model (1968, pp. 11–18), perhaps the simplest and most basic of the instructional development models, is composed of four basic components, as illustrated in Figure 3. The first component of the model involves the construction of explicitly stated instructional objectives. The second component involves the assessment of the students' entry behavior prior to the beginning of instruction. The third component, the instructional process, incorporates making decisions regarding instructional procedures or techniques designed to facilitate the attainment of the stated objectives. Decisions regarding use and sequence of presentation are included in this component. The last component, performance assessment, is an attempt to determine the extent to which performances specified in the objectives have been achieved. The assessment results determine the nature and extent of the recycling.

Components one and two of the model (constructing explicitly stated objectives and assessing the entering behavior of the learner) may be performed concurrently.

Certain emphasis, interpretations and caveats which apply to the instructional development process, as presented in the models, are in order.

First, it may be emphasized that the instructional development process is non-linear and is a system which has no formal points for beginning or ending. The lines on the graphic models are not uni-directional and thereby the concept of linearity is negated; further, since instructional development efforts may begin at various stages of the process and are constantly monitored, reassessed and recycled, there is no fixed beginning, no fixed ending. Robert L. Baker and Richard E. Schutz (1971, p. xv) write in regard to this:

> Educational development, unlike educational research, has no prescribed methodology so that fixed starting and ending points in development activities are difficult to identify.

This interpretation is also applicable to instructional development.

Second, the importance of decision-making based on evidence needs emphasis. Dale Hamreus explicitly states that the major weakness in the systems process is the inability of team members to make decisions on the basis of empirical evidence as procedures are selected to achieve objectives. He notes that decisions usually are made on the basis of past experiences.

A third emphasis is the desirability of recognizing the instructional development concept as having a much broader scope than the media concept. Media fall within the parameters of instructional development and serve as vehicles by which teachers achieve desired instructional outcomes.

This relationship is clearly illustrated in Box C of the mini-model (Figure 2). Objectives should be analyzed in terms of the learning performances expected of students. This analysis assists the developer in media selection. If an objective requires students to describe a process which involves motion, then a medium utilizing motion should be selected. An objective may require a student to explain the results of time-lapse photography; a film which shows time-lapse would be appropriate to use in this situation. It cannot be overemphasized that while media and media support services may well provide the means for more inclusive development efforts, these services are only a part of the total instructional development process.

Fourth, the stage in the process at which objectives should be written should receive careful attention. Writing objectives prior to assessing the entering behavior of the learner can result in the presence of students in a learning situation who already possess a mastery of content materials before instruction begins. In this connection, it should be emphasized that entering behavior should not be confused with mental ability. Entering behavior refers to behavioral evidence of the individual's mastery of content material before instruction; mental ability refers to potential to learn. Should objectives be prepared before assessing the entering behavior of the learners, a pre-test should be administered in order to determine not only what content material the student has mastered, but also whether the student has prerequisites, abilities, and skills necessary for a mastery of the behaviors specified in the objectives. However, writing objectives before assessing entering behavior is a defensible practice when the teacher has taught the course over a period of years and the characteristics of the student population have not changed drastically during this period of time. The perceptive teacher's understanding of the basic elements in the learning situation permits this type of pre-planning.

PRACTICAL SUGGESTIONS

The heuristics of instructional development serve as a point of departure for developers as they prepare to work with teachers. These heuristics also serve as a guide for the developer as the work continues with teachers throughout the various stages of the development process. Among the more important heuristics are: (1) learn the teacher first; (2) seek out dirty jobs; (3) do not let words get in the way; and (4) proceed on the basis of agreement (Barson, *et al.*, pp. 358–371). Proceeding on the basis of agreement is essential if the developer expects to establish an atmosphere of trust and if the developer is to continue working productively with the teacher. While these heuristics may seem obvious to experienced developers, they are easier to verbalize than to

practice and consequently are followed by few inexperienced developers.

Some developers, for a variety of reasons, look for new techniques and a high degree of mechanical sophistication when working with teachers. This quest should not eliminate the use of those older practices that have been found to be effective. In selecting techniques, a common sense yardstick is that of selecting the technique that gets the instructional job done in a way that benefits the learner while costing less in time and in human and nonhuman resources. As Mager stated, the competent developer doesn't give a rusty zipper about whether the procedures he is using are old or not. He cares only whether they work.

A successful developer is a change agent. A change agent, as defined by Rogers and Shoemaker, is a

> professional who influences innovation-decisions in a direction deemed desirable by a change agency. He usually seeks to obtain the adoption of new ideas, but he may also attempt to slow down diffusion and prevent the adoption of what he believes are undesirable innovations (1971, p. 35).

The developer realizes that too rapid a rate of change is neither good for individuals within an organization nor good for the organization. He is aware that change must be administered in the right place, at the right time and in proper dosage. The developer, in this sense, diagnoses, prescribes and administers change.

As a change agent, the developer should study the situation he wishes to change. He should be aware of the forces in the organization which can hinder the change process. These forces may be classified as restraining forces, driving forces and neutral forces (Lippitt, 1971). Restraining forces are those which hinder the desired change. Driving forces are those which facilitate the change and thereby are considered positive and an asset for bringing about the desired change. Neutral forces neither impede nor foster change. These forces may be human as well as nonhuman. For example, if a developer in working with a teacher on curriculum revision found that the teacher had a written list of explicitly stated behavioral objectives and that the tests attempted to measure all terminal performances specified in the objectives, the list of objectives and the tests may be considered positive forces in the sense they can be used to assist in bringing about curriculum revision. The teacher's desire to improve instruction is a positive force in this change effort. Similarly, flaws in instructional technique and the omission of feedback would be categorized as restraining forces.

As the developer studies the situation he wishes to change, he must examine carefully the organizational structure in which change is to take place. He should attempt to increase the effectiveness of the driving forces, reduce the influence of the restraining forces and modify

neutral forces so that they become driving forces. Additionally, the change initiator must consider the magnitude of the change. Magnitude relates directly to the level of financial and administrative support needed, as well as to whether the proposed change is within the purview of the initiator of the proposed change. A basic question which the developer should ask the teacher is, "Do you have the authority to make this change?" This question should be asked in situations which require major changes in curriculum, materials, facilities, or procedures. A teacher wishing to revise completely a course including objectives should be asked this or a similar question.

Strategies employed in solving instructional problems will vary from organization to organization depending upon the constraints imposed on the organization. However, techniques for working with people will not change proportionately. The suggestions which follow may prove useful to the developer in working with his client. The developer should:

1. Avoid, whenever possible, educational jargon peculiar to the field of educational technology. Teachers may not have this jargon in their functional vocabularies, with the result that communication is impeded rather than improved;
2. Develop good listening habits and skills. Let the client do most of the talking, especially in the early stages of curriculum revision. The client will reveal the real educational problem, sooner or later, directly or indirectly;
3. Ask probing questions of the client. These questions should lead the client to understand more clearly what has to be done. Answers to these questions should also provide the developer a deeper insight into the nature and source of the problem;
4. Create an atmosphere of mutual trust with the client. This atmosphere is necessary if the developer is to work successfully with the client. Confrontations and highly critical behavior should be avoided;
5. Remember that face-to-face communication is superior to phone calls and written communications.

No matter what is to be done and how much is to be done regarding curriculum revision, the basis of developer's success depends largely on his skill in communicating with the teacher.

SUMMARY AND COMMENTARY

Film, radio, television and other media forms have been used in classroom instruction for quite some time. However, they represent only the hardware dimension of technology, and usually are introduced after instruction has been planned. The optimum goal of planning instruction to achieve maximum results utilizing available resources is rarely achieved under this circumstance. A systematic process purported to be valuable in achieving maximum results in the classroom is instructional development. Many attempts have been made to define instructional development. One adequate definition of the process is that instructional development is a systematic process for designing, sequencing, implementing, evaluating, and constantly monitoring instruction with the intent of improving instructional methods, and thereby, improving learning.

Instructional development is a product oriented process. Since the product is to be used by people, considerable attention has been focused recently on the human dimensions of the process. The explanation of any process is difficult. Explaining a process in two dimensional form without implying linearity is a more difficult task. However, instructional development is considered to be non-linear in that development efforts may begin at various stages. There is no end since development activities are constantly monitored, reassessed, and recycled. Graphic models have been used to explain the instructional development process since models provide, in graphic form, a gestalt view of an idea and since models clearly show the relationships which exist between component parts.

The intricacies of instructional development are such that the developer must be aware that he will be working with people attempting to bring about instructional change. The developer, in this capacity, is a change agent and must be able to diagnose, prescribe, and administer change in the right place, at the right time, and in amounts suitable to the individual and the organization.

A developer can become a catalyst in bringing about instructional change. As a catalyst, the developer may become a central force around which the potential of technology can evolve. Robert Heinrich (1977, p. 25) in addressing the potential of technology remarked:

> When instructional technology becomes sophisticated enough to be considered an alternative rather than a complement to traditional instruction it becomes a base for the design of a new education system and a potent modifier of the present one. Standing squarely in the way, of course, is the superstructure of the present system.

Perhaps the potential of technology has not been fully realized, in part, because personnel in technology have created confusion about its nature, scope and use. Jargon in the field is increasing at an alarming

rate and likely contributes to the confusion. Technologists often fail to communicate with each other, fail to communicate with administrators, in particular and the public, in general. The confusion and communication failure undoubtedly has slowed progress in the use of technology. Richard Gilky (1976, pp. 8–11) points out that the public considers technology neither a part of education's problem nor its solution. Gilky asserts that it is the responsibility of technologists to make the public aware that technology can be a part of the solution. In becoming a part of the solution, the developer should, among other things, avoid the over-use of jargon peculiar to the field of educational technology, develop good listening habits and skills, ask probing questions of the client, and remember that face-to-face communication is superior to such communication practices as telephone calls and written communication, particularly in the early stages of curriculum revision.

As an "end page" comment, it is emphasized that the presentations included in this chapter were designed to be suggestive rather than comprehensive in explaining the nature and scope of the instructional development process. It is doubtful that a single document can be truly comprehensive in treating this topic. As Haney and Ullmer observed, to say what something is all about is not necessarily to say all there is to be said about it.

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CHAPTER III

STRATEGIES FOR TEACHING AND LEARNING INSTRUCTIONAL DESIGN

By Frank V. Colton

Nearly a decade ago, at Wayne State University, while taking one of my first courses in instructional technology, Dr. John Gordon introduced me to a basic model for planning instruction. Inasmuch as I had never given much thought to the design of instruction, I was at first skeptical about the necessity to perform many functions while attempting to teach something as simple as tying a bow. (See Figure 1) However, the simple logic associated with each of the steps and the subsequent proof of their worth in working with youngsters (in our classes to teach uncomplicated tasks) soon gave me all the evidence I needed. I have a feeling that Gordon's model and many of his informal papers which he generously shared with his students would have been quite valuable to the public, yet he did not publish them.

Figure 1. A Basic Model for Planning Instruction*

1. INTRODUCE THE TASK—It is important to tell learners *what* they are going to be doing. (Sometimes it even helps the teacher to think about exactly what is going to happen!)
2. PUT THE TASK INTO CONTEXT—Sometimes we forget to capitalize on reminding learners about what they have learned before and what they will soon be learning. This is also important to a teacher in making early decisions about prerequisites and sequences.
3. SECURE A COMMITMENT—Lessons should be made appealing enough to learners so that they are ready and willing to say, "Let's go!"
4. POST TEST—Does this step seem out of place? Not really. How many times do we teach things to students which they *already know?* (This kind of post test probably won't be the usual paper and pencil kind. Sometimes just asking a simple question is sufficient to determine whether or not someone can already do a particular thing.)
5. PRE TEST—"Pre" in this case means prerequisites. Does the learner possess the necessary prerequisite skills to perform this task? If the answer is "no," we must make provisions for teaching these skills first.
6. TEACH—Incredible! We have done all these other things and have yet to teach. Yet, all the above steps are important and much of what was learned in going through those steps must now be incorporated into the teaching act.

7. POST TEST—(Again!) Obviously, this is the "proof of the pudding" step. After all, isn't this why we went to all this trouble in the first place?

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*The comments following the bold-faced headings are the author's fuzzy recollections of Dr. Gordon's original explanations.

These kinds of lessons were important in helping me to realize that the design of instruction should encompass a thorough and precise methodology, linked with a technology that involves people and devices, a technological approach to curriculum development. McNeil (1977) commented that:

> Technology at first glance appears to be concerned with *how* to teach rather than *what* to teach. Technologists themselves view their curricular function as finding efficient and effective means to predetermined ends. A second glance shows that technology—the means produced—has a lot to do with the kind of matter that is or is not learned. (p. 35)

Therefore, the general goal of this chapter is for you to become aware of a technologist's philosophy and of some of the techniques used by him in teaching a graduate level course in instructional design. A strategy for teaching a course designed for in-service teachers, librarians, media specialists as well as for students from other disciplines such as allied health, dentistry, nursing, etc. will be described. Most of our students do not anticipate becoming full-fledged instructional developers. However, they do take the course hoping to improve their own instructional abilities. I stress that whether or not teachers plan to become instructional developers they are still responsible for doing the best possible job of designing their *own* instruction (Colton and Caton, 1974). Emphasis is given to an approach which stresses that for each step in the design process there is a corresponding product. The selected examples of in-class activities shown in this chapter are planned to help reinforce the process-product principle.

Every institution and every instructor is bound to follow a slightly different approach to the teaching of instructional design. Therefore, what is included here is in no way meant to describe strategies which would be entirely appropriate in all other situations. However, it is hoped that you will spot some usable segments in my approach and be able to adapt them to your own strategy for teaching design.

THE CONTEXT OF DESIGN COURSES

In an effort to place this chapter in context, I thought it important to investigate the courses in instructional development-design being taught in representative colleges and universities. For this purpose,

I surveyed the individuals who made presentations for the Division of Instructional Development at the 1977 convention of the Association for Educational Communications and Technology. Those being surveyed were asked to:

1. List any courses being taught at their institution which were planned primarily to give students the skills required in order to systematically design instruction. (See Table 1)
2. State the year in which the course or courses were first taught at their institution and, if a course was not a new one, to give the old course title if it had changed. (See Table 2)
3. State the percentage of course time devoted to the following categories of activities. (See Table 3)
   (a) Time and activities devoted to *rudimentary elements* of designing instruction (i.e., specification of objectives, task descriptions, task analysis, etc.)
   (b) Time and activities devoted to decisions about media *selection* (i.e., whether films, filmstrips, slides, transparencies, etc., are appropriate).
   (c) Time and activities devoted to the *design and preparation* of media choices (i.e., the planning and production of media choices).

TABLE 1. GENERAL INFORMATION

Number of surveys sent	35
Number of returns	19 (54%)
Number of institutions indicating course(s) taught in instructional development-design	14*
Number of courses being taught	29

*Two institutions responding were service organizations which did not teach courses.

TABLE 2. NAME OF COURSE AND YEAR INITIATED

Design of Learning Environments	1970
Task Analysis	1970
Learner Analysis	1970
Introduction to Instructional Development (Audio Visual Communication Formal Education)	1976
Instructional Product Development (Programmed Instruction)	1968
Introduction to College Teaching	1975

Competency-based Instruction	1974
Introduction to Educational Technology	1973
Instructional Systems	1974
Design of Modular Instruction	1975
Instructional Design	1970
Programmed Instruction	1967
Instructional Design	1972
Instructional Technology	1972
Instructional Development, I	1976
Instructional Development, II (Evaluation)	1976
Design and Production of Educational Media	1976
Instructional Design and Development	1975
Instructional Development in Higher Education	1975
Principles of Instructional Development	1973
Seminar in Instructional Development	1971
Programming for Self Instruction	1970
Foundations of Educational Technology	1968
Design and Development of Instruction	1968
Competency-based Instruction	1973
Instructional Design and Development	1975
Instructional Materials Production	1975
Educational Media and Technology	1975
Curriculum Theory and Dynamics	1974

TABLE 3. ALLOCATION OF COURSE TIME BY CATEGORIES

Category A – Basic design decisions	67%
Category B – Media selection	11%
Category C – Design and preparation of media	19%

(Not all institutions reported 100% time in the three categories provided.)

Certainly, only limited conclusions can be drawn from the data inasmuch as only a small sample was utilized. However, the sample is representative of people who are obviously concerned with course offerings in the specialized area of instructional design. The data indicate that courses in instructional design are very new courses, the oldest listed being only ten years old (Table 2.) Table 2 also shows the diversity of titles given these courses. Most of the courses are graduate as opposed to undergraduate offerings.

From Table 3 we see that by far the greatest amount of time (67%) is devoted to what we might call basic design decisions which include

those items in descriptive category A. Lesser amounts of time are devoted to the other categories, B and C, which relate to media selection and production. It seems fair to assume that most people responsible for designing these courses believe that attention needs to be given to the basic design decisions in courses of this nature, and that other related areas, such as media selection and production, might be addressed in a contextual sense within the same course or possibly left to be explored separately in other courses.

BACKGROUND AND STRUCTURE OF THE DESIGN COURSE

When I first came to the University of Kentucky, we offered a course titled Programmed Instruction. For a couple of years I taught the course. It was a fascinating adventure – I taught students (and myself) how to write nice linear programs, perhaps less dull branching programs, and generally ended up with a bunch of students who probably wrote programmed instruction for the only time in their lives. When I was finally able to settle down and give it some thought, I succeeded in getting the course title changed to Basic Instructional Design. Now, at least, we end up with some students who, even though they don't usually become instructional developers, become better teachers, because they have given some attention to the meaning of what has been called "the moment by moment events of instruction" (Gagne and Briggs, 1974).

STRUCTURE

One thing I've always liked about teaching courses in instructional technology is that since we espouse the stating of objectives, etc., it certainly behooves us to do the same in our own classes. In other words, we surely would not want to be placed in the embarrassing position of having to say to our students, "now don't do as I'm doing, but do as I am saying!"

Therefore, students know from the first day of class what is expected of them. The syllabus shows them that they are going to be studying a process called instructional design which, when pursued with dedication and thoroughness, can yield a highly desirable product – well designed instruction. Ninety per cent of their grade, in one way or another, is linked to this process-product cycle. The other 10% also has an indirect connection in that each student abstracts three research studies which relate to instructional design.

More than anything else the feeling I try to convey in the class is one of openness. No hidden agendas. No pop-quizzes. None of this business of the students trying to "psych-out" the instructor to find out what is expected. It is all "up front." By getting as much out in the

open as we can in the beginning of the course, it removes a lot of tension. I also try to capitalize on the varied experiences of the class members. This helps develop the principle that good instructional design techniques can be applied to any discipline. It should be obvious at this point that the grades are not determined by the curve – that students are given the written standards which they then try to achieve.

REALITY ASPECTS OF PLANNING AND TEACHING A DESIGN COURSE

Davis, Alexander and Yelon (1974) in their text, *Learning System Design*, stress the importance of the identification of a referent situation for objectives. A referent situation is a situation outside of a course (for example, in one's job, hobby, or in another course) where it is important to achieve the particular objective being taught. The notion of the referent situation has been crucial in the planning of our instructional design course. I have constantly tried to avoid having students work with contrived examples which have no relationship to their interests or responsibilities. Rather, I have encouraged students to work with topics which are currently relevant to them.

As a general approach, I have tried to stress those things which teachers normally have a hard time accomplishing. For example, the teacher is usually given a list of broadly stated goals for which her students are to be responsible. The conversion of these broadly stated goals into explicit and measurable instructional objectives is a teacher-needed skill which is often lacking. Likewise, the development of appropriate evaluation devices which parallel instructional objectives is a dimension with which most teachers have difficulty.

My experience has been that I am better off trying to emphasize some of these simpler components, at least in the early stages of the course, than attempting to become highly sophisticated too soon. I spend time at the beginning of the course making sure that students comprehend some of the basic reasons for the use of instructional objectives. The additions to the literature of books like *Using Instructional Objectives in Teaching* (Clark, 1972) and *Objectives in Curriculum Design* (Davies, 1976) have helped to make this task easier.

Another characteristic of our procedure, one which is sometimes a bit unusual in graduate courses, is that I try to actively involve the students by offering as many opportunities as possible to practice the design process. I currently use the textbook *Learning Systems Design* (Davis, Alexander and Yelon, 1974) and the accompanying workbook and slidetape series. However, I am finding that practice activities which emphasize the students' own referent situations rather than those depicted in the commercially prepared materials are more appropriate to

their needs. I have designed activities for large groups, small groups, pairs of students and individuals. Students seem to enjoy working with their colleagues more than being interfaced with a workbook. When students understand that they are not competing with their fellow students for grades, they like the reinforcement and support gained from working with their peers.

SELECTED CLASS ACTIVITIES

The activities described in this section are included because they are representative of a variety of configurations for learning and because they were designed to meet particular problems.

PRE-ASSESSMENT ACTIVITY

On the first day of the course students are given an opportunity to express in writing their notions about how instruction should be designed. I have discovered that much of what teachers have done in the past in conjunction with making lesson plans, course outlines, syllabi and other plans can be very useful if allowed to surface. The point is that it is important for students to discover that they have been doing a lot of things that were perfectly appropriate and with this knowledge the design process seems a little less awesome to them.

SITUATIONAL-STATES ACTIVITY

Another activity somewhat closely related to the one on preassessment is one we call a situational-states activity and is based on the "what is, what ought to be" idea. The activity is shown in Figure 2. Almost all of the students in our course have had some professional experience.

Figure 2 shows situational "states" of teachers, librarians-media specialists and administrators as these positions relate to instructional development. Students are asked to choose the job category of most interest to them and respond to the statements.

Instructions: Read across the page and place a check ( ) before the statement which is more appropriate to you.

STATE "A"		STATE "B"
It *might* be that you . . .		It *could* be that you . . .
1. __ feel you should redesign your instruction but you didn't know how.	OR	__ have sought out instructional development courses, workshops, or references.

2. ___ prepare lesson plans but they are mainly for your own use.	OR ___	have written objectives and activities of which students have copies.
3. ___ use media occasionally but mainly because "it's the thing to do."	OR ___	select media on the basis of how it fits your learners' needs and competencies.
4. ___ spend a lot of time explaining to the group what is expected of them.	OR ___	spend a lot of time helping individual students pursue specialized interests.
5. ___ find making decisions about grades a traumatic experience.	OR ___	are constantly inventing ways for students to mark their own progress.
6. ___ often wonder why kids seem so bored in school.	OR ___	find yourself working even harder but not minding because kids are involved.
7. ___ dread having your administrator pay an in-class visit.	OR ___	proudly share the details of your learning system design.
8. ___ find it difficult to talk with parents about their children's work.	OR ___	feel much more comfortable talking with parents because you have specific goals for their children.
9. ___ find yourself without counsel regarding instructional development.	OR ___	have the cooperation of librarians, media specialists, supervisors and administrators in your development effort.
10. ___ feel it is someone else's job to develop curricula.	OR ___	even consult with *kids* on what they would like to learn.

Figure 2. Situational states of teachers as these positions relate to instructional development.

Figure 2 (Cont'd) – Librarians – Media Specialists

STATE "A"		STATE "B"
It *might* be that you . . .		It *could* be that you . . .
1. __feel instructional development is outside your domain.	OR __	expect to be involved in instructional development
2.__ are limited in staff and other duties take precedence over instructional development.	OR __	have or are seeking staff and financial support for instructional development
3. __ seldom discuss developmental projects with faculty or administrators.	OR __	are prepared to suggest resources and alternative strategies for development efforts.
4. __ are hesitant to discuss techniques for improving teaching.	OR __	suggest linkages between teaching strategies and media utilization.
5 __ feel it a bother to confer with faculty regarding media or materials purchases.	OR __	believe that knowledge of teachers' goals for their students is a key factor toward building a sound collection.
6. __ wonder why only a few faculty utilize your supportive services.	OR __	are constantly searching for ways to assist all faculty and students through supportive services.

Figure 2 (Cont'd) – Administrators

STATE "A"		STATE "B"
It *might* be that . . .		It *could* be that . . .
1. ___ your school provides teachers "broad goal" curriculum statements.	OR ___	"broad goal" curriculum statements are broken down into specific learning objectives.
2. ___ your school provides no professional assistance in helping teachers plan instruction.	OR ___	your school holds regular in-service sessions devoted to curriculum development.
3. ___ your school provides a planning period for most teachers.	OR ___	your school provides special reward incentives for teachers engaged in instructional development.
4. ___ your school expects teachers to develop "innovative curricula."	OR ___	your school system has identified areas of curriculum need through systematic study.
5. ___ your school expects teachers and students to use "audiovisuals."	OR ___	your school expects teachers, librarians and media specialists to help prescribe the most appropriate choices of print and non-print media matched to learning objectives.

In fact, the average number of years of teaching experience is over four years. After students have located the most appropriate category (teachers, librarians or media specialists, or administrators), they mark their sheets according to their experience with the various statements. In sharing the responses with the total class, I have found that the majority of students end up in "State A" while agreeing that being in "State B" would certainly be more desirable. Admittedly, this activity is not nearly as meaningful with the graduate students who lack teaching experience. I have found that students are more apt to become committed to a class when they feel that what they are going to learn will help them with some of their everyday problems. This kind of activity shows them some potential ways of changing and solving some problems.

INSTRUCTIONAL OBJECTIVES CONCERNS ACTIVITY

I mentioned earlier that a book by Cecil Clark, *Using Instructional Objectives in Teaching*, has been helpful in providing a background for discussing some areas of concern related to the use of instructional objectives. As an activity for which students can prepare outside of class I ask them to investigate the list of concerns shown in Figure 3.

Figure 3. Some areas of concern related to the use of instructional objectives.[1]

For discussion . . .

1. **How shall we define an objective?**
2. **How do objectives differ from each other?**
3. **How are objectives related to each other?**
4. **How are objectives generated from an entire unit?**
5. **Why have instructional objectives?**
6. **How does the use of instructional objectives differ from what teachers have been doing all along?**
7. **How useful are general educational objectives (goals)?**
8. **Have I generated measurable objectives?**
9. **How appropriate are my objectives?**
10. **How important is it to sequence objectives in a given order?**
11. **How are objectives used in planning instruction?**
12. **How can I tell when my objectives have been attained?**
13. **What effects do instructional objectives have on individual differences?**
14. **Who should be responsible for developing objectives and what sources are available?**
15. **How usable is a taxonomy of educational objectives?**
16. **What does research say about the use of instructional objectives?**

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[1]Clark, Cecil D. *Using Instructional Objectives in Teaching.* Scott, Foresman and Company, 1972. (Quoted with permission of publisher.)

The "pros" and "cons" presented by Clark always stimulate lively discussions and these discussions seem to allay some of the fears inherent in some students with regard to instructional objectives. Since instructional objectives are central to the rest of the design process I teach, I feel it is essential that any concerns be openly explored.

ACTIVITIES IN DEVELOPING SKILLS IN WRITING OBJECTIVES

Amazingly, some students have never been required to prepare instructional objectives; therefore, I provide them with a model, the "A, B, C, D Model," which is shown in Figure 4.

Figure 4. A, B, C, D Model

When constructing an objective, consider the following factors . . .

The Audience	Names who, in what situation, with what prerequisite skills.
The Behavior	Describes the action word. Write, say, point to, draw, act out, etc.
The Conditions	Describe: 1. What will the learner respond to (pictures, real objects, etc.) 2. What directions will be given to the student and how will they be given (written, said, etc.) 3. What things will the learner have at his disposal? a. to use as a reference b. to manipulate
The Degree	1. How long does he have to complete the task? 2. What are the criteria against which a response is judged either correct or incorrect? 3. What is the degree of accuracy desired? 4. A fourth question could be asked here: How long should the learner retain the capability? For this course we shall not be too concerned with trying to determine just how long a skill should be retained although in most cases we would assume retention would be at least until the completion of the course.

The built-in mnemonic helps students to remember the essential elements of an objective. However, knowing the components of the model and being able to put together an intelligible instructional objective seem to be two entirely different skills. To assist students who have trouble putting the elements together, I have developed a module for that purpose, a part of which is shown in Figure 5. (See next page)

It has been my experience that students become frustrated when trying to write instructional objectives by themselves. They need someone around to react to what they have written. Therefore, we use the "A, B, C, D Model" and the module just mentioned as in-class activities so that students don't get bogged down in this crucial stage of the process. Another reason we are so concerned about students being able to write sound instructional objectives is that they must design units or modules for their class projects, and again, the formulation of proper instructional objectives is a "must" if their projects are to be successful.

Another skill closely associated with writing good instructional objectives is that of being able to construct appropriate evaluation devices which parallel each objective. This provides an excellent opportunity for pairs of students to work together. One of the partners writes an

Figure 5. Excerpt from module on writing instructional objectives.

Sometimes it is difficult to know how to actually begin writing an objective even though you have in mind a good action verb. Here are some alternatives for getting started:

"Having read the textbook chapter on . . ."
"The student in sixth-grade chorus . . ."
"After having participated in the class discussion . . ."
"The learner will . . ."

After having examined these several examples it appears that objectives usually start with identification of some *conditions* or by naming for whom the objective is intended (the *audience*).

To illustrate formulating an objective, look at this example:
First, think of an action verb and the subject-matter topic:

construct (will construct)	right triangle
(action verb)	(subject-matter topic)

Then think about how you want to start the objective, remembering objectives usually start with a statement of the conditions or the audience . . .

The seventh grade math student with the aid of a protractor	
(the audience)	(conditions)

and add the degree . . .

accurately
(degree)

USE THE REST OF THIS PAGE AS A WORKSHEET AND TRY CONSTRUCTING AN OBJECTIVE ACCORDING TO THE FOLLOWING SCHEME:

Think of your action verb and the subject matter and write them:

_____	_____
(action verb)	(subject-matter topic)

Now, think of how you want to start the objective:

_____
(name the audience)

OR

_____
(mention some conditions)

Now write the degree part of your objective:

_____
(degree – how well / how quickly?)

(cont'd)

SEE IF YOU CAN COMBINE ALL FOUR PARTS

(first try) _____

_____

_____

How does it look? A little rough, perhaps? If so, have another crack at it by revising your objectives on the lines below.

Objective No. 1

(second try) _____

_____

_____

AT THIS POINT IT IS IMPORTANT FOR YOU TO HAVE SOME FEEDBACK FROM YOUR INSTRUCTOR. IF YOU HAVE BEEN SUCCESSFUL, TRY WRITING ANOTHER OBJECTIVE USING THE SAME METHOD. FIRST, THINK OF AN ACTION VERB AND SUBJECT TOPIC.

Next, begin writing the objective by naming either your audience or stating some conditions. Now add the degree part to the behavior and combine the whole thing.

Objective No. 2 _____

_____

_____

OF COURSE A VERY GOOD WAY OF TESTING YOUR OWN OBJECTIVE FOR COMPLETENESS IS SIMPLY TO GO BACK TO THE A, B, C, D MODEL AND CHECK TO SEE THAT YOU HAVE INCLUDED ALL THE RELEVANT PARTS.

---

instructional objective and gives it to the other partner. That person, without any prompting, must then write the actual evaluation device (or description of same) which would be used with the objective. If the person writing the evaluation part has difficulty or else writes an evaluation device which is unacceptable to the author of the objective, then there is obviously a problem which must be solved. The partners then reverse roles. The activity stresses the necessity of writing unambiguous objectives which clearly indicate the appropriate evaluation measure required.

INITIAL PLANS FOR CLASS PROJECT ACTIVITY

By the third week of this semester-long course, I want to have assurance that all students are making a good start on their class projects. I have seen too many students who have procrastinated on projects of this kind; they approach the end of the semester and have to throw together a crash effort to complete their work. Additionally, the course is designed for students to progress with their own projects at about the same pace as the course progresses through the study of the design process. Therefore, students are asked to complete the form shown in Figure 6. Answers to question number four (What, if any, problems do you have at this point regarding the designing of the unit? How may I be of assistance?) have been most revealing and I believe in some cases have "saved" students from becoming discouraged and dropping the course.

Figure 6. Initial Plans for Class Project

Name _____

Please react to the following questions:

1. **What is the approximate goal of your project to be? (Not the specific learning objective(s)). Example: to develop a unit, lesson, module, etc., for instruction of students in the use of linear equations.**
2. **Have you prepared learning objectives for the unit? ___ Yes ___ No. If "no," by when do you intend to do so? (date) _____**

   Have you prepared test items to support these objectives? ___ Yes ___ No. (Disregard if you answered "No," to No. 2.)
3. **If you have progressed to this point, *list in short phrases* what additional steps you have taken in designing your unit. (Again, disregard if inappropriate.)**
4. **What, if any, problems do you have at this point regarding the design of the unit? How may I be of assistance? (Use the back if necessary.)**

ACTIVITIES FOR CATEGORIZING OBJECTIVES

One of the most difficult set of skills for students to acquire is that of identifying learning tasks by their intellectual categories. It is necessary that students be able to categorize learning tasks as response chains, discriminations, concepts, rules (or principles) or problem solving. (Gagne and Briggs, 1974). This ability to classify objectives into broad categories allows one to then consider certain conditions, both internal and external to the learners, which are associated with each category. These conditions provide precise clues for the planning of instruction.

As a starting point in helping students to acquire the categorizing skill, we discuss the definitions of the different categories. In addition to the Gagne and Briggs (1974) reference and Davis, Alexander, and Yelon (1974), a chapter by Herbert J. Klausmeier titled "Instructional Design and the Teaching of Concepts" (in Levin and Allen, 1976) is especially helpful in clarifying the concept category. Then we gave students lists of tasks similar to the one shown in Figure 7, to categorize and discuss in class.

Figure 7. Task Classification

The following are incomplete statements of objectives. In order to conserve space and time, only the conditions and the action word have been included. Mark the first letter(s) of the appropriate categories beside each task: response chain, discrimination, concept, rule, problem solving.

1. **When the teacher shows the learner a picture of an object, the learner will say the name of the object represented by the picture.**
2. **When the teacher says the German word, the student will say the English equivalent.**
3. **When given a collection of objects, some of which are oranges and some of which are not, the learner will place all of those objects which are oranges into one pile and all of those which are not oranges into another pile.**
4. **When given an array of objects, some of which are rolling and some of which are not rolling, the learner will point to those objects which are rolling.**
5. **When given the statement of a problem, the learner will write the correct answer to the problem.**
6. **When the teacher says the chemical name, the learner will write the chemical symbol.**
7. **When the teacher gives the learner a bunch of living animals, some of which are frogs and some of which are not frogs, the learner will point to all those animals which are frogs and state why he says that they are frogs.**
8. **Given a problem in which Boyle's law is used, the learner will write the correct solution to that problem.**

They are then asked to generate objectives from their own subject matter areas in each of the categories.

Next, we try to emphasize the importance of the fact that once one has been able to categorize an objective, it is important to apply appropriate information related to that category to the design of the instructional sequence. For example, if a task is one requiring the identification of a concept we try to get the students to think about a series of moves which this implies would be built into their design. Figure 8 shows some moves associated with the teaching of a concept.

Figure 8. Moves Associated with Teaching Concepts

1. Prerequisites previously established by discrimination.
2. Start with positive example.
3. Use both examples and non-examples. (Also good to have student generate his own.)
4. Emphasize criterial attributes for search routine.
5. Use examples other than those given in lesson.
6. Usually have student give a definition of the term.
7. Confirm quickly.
8. Mention name just prior to introducing another instance.
9. Continuity of presentation of instances and responses.
10. Have student verbalize search routine.
11. Verbalize cues to help student recall and restate.
12. Present instances to which student can generalize.
13. Start with clearest examples and work to the more difficult.
14. Use instructions to stimulate recall.
15. Tell why it isn't an example – not just that it isn't.
16. Encourage and guide discovery.

GROUP ACTIVITY TO PRACTICE TEACHING CONCEPTS

Because concepts are probably the most common type of task taught in schools, we spend a lot of time concentrating on them. An activity which students seem to enjoy and also derive much benefit from is one in which the class (usually about 20 in number) is divided into groups of 4 or 5 students each. Each group is given a concept and the members are told they must demonstrate to the rest of the class how it would be taught. The group may either choose to teach the concept to the rest of the class or may role play within the group to show how it would be taught. The peer criticism is keen but the groups are also appreciative of well-thought-out instructional sequences.

OTHER STRATEGIES FOR LEARNING INSTRUCTIONAL DESIGN: PUBLISHED RESOURCES

Many in-service teachers are now being called upon to exercise instructional design skills when they have neither had the opportunity to acquire these skills nor are in a position to obtain them. These teachers face a real dilemma. They know they should be involved in systematic approaches to planning because everything they read alludes to that notion, but they seldom receive the kind of training or have the experience required to become proficient. Many teachers have, therefore, had to attempt to train themselves through searching the literature and trying their newly discovered techniques in practice.

In exploring the literature on instructional design, it appears that at one time programmed instruction was the model used to show people the process of breaking down tasks into their component parts, arranging sequences, providing cues and prompts and deciding upon appropriate evaluation indices. This was at a time when other strategies for designing instruction had either not been published or were not yet popular. As other strategies emerged, people began to realize that programmed instruction was only one of the many formats which could be used to help students to achieve their objectives.

In the middle 1960's, more works began to appear which expanded the concepts of instructional design beyond those of programmed instruction. With the publishing of Robert Mager's *Preparing Instructional Objectives* and Robert Gagne's *The Conditions of Learning,* the simple notion of "where am I going, how do I get there, and how do I know when I have arrived?" began to have real significance. College and university professors attempting to teach students instructional design often relied on more traditional psychology or learning theory texts (if they used one at all) to provide the theoretical basis for their newly found discipline.

Soon a glut of books about instructional design began to appear. However, many of these books were so general in nature that they were not very helpful to students needing to acquire precise skills to design instruction. While these books contributed in a total way to a synthesizing of the instructional development picture, they for the most part did not reach the level of the aspiring instructional designer.

Finally, by the late 1960's, some significant and helpful works were published. A series of monographs from the American Institutes for Research, authored principally by Leslie Briggs, zeroed in on discrete instructional design functions. Gagne's second edition of the *Conditions of Learning* (1970), this time with an accompanying *Student Handbook,* continued to reflect the much needed blend of learning theory and common sense. Then in 1974, Gagne and Briggs combined their talents to write *Principles of Instructional Design,* which was based upon the three assumptions that: (1) instructional planning must be for the individual; (2) instructional design has phases that are both immediate and long-range; and (3) systematically designed instruction can greatly effect individual human development.

An important theory, stressed in another recent text and accompanying materials, is that often the designer and teacher are one-in-the-same. Davis, Alexander and Yelon (1974), of Michigan State University, have authored the text *Learning System Design.* With the assistance of Allan Abedor, they also produced a series of filmstrips and audio tapes, a student workbook, and a teacher's manual. Taken as a complete package,

these materials give the design student the opportunity to become an active participant in the practice of design procedures.

The extensive bibliography which appears at the conclusion of this chapter will hopefully alert students and teachers of instructional design to the many sources of information currently available. While the bibliography does not attempt to be inclusive, it does include many of the major works published since the middle 1960's, with a few noteworthy references prior to that time.

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CHAPTER IV

COMPREHENSION AND THE DESIGN OF INSTRUCTIONAL MATERIALS

By

Buford E. Wilson

THE NATURE OF COMPREHENSION

Many times instructional materials and strategies fail or are only partially successful because of misunderstanding about the nature of comprehension. In this chapter we will examine some of the factors involved in comprehension and see how these factors are related to the design of instructional materials. Although the points I intend to make are true of comprehension in general, this paper will focus upon the understanding of language.

Typically, understanding what another person says seems to be a smooth, effortless, automatic process. People speak and we just know what they mean. Partly as a result of this ease of understanding words we are led to false conclusions about the way that words work in allowing us to understand other people's spoken and written messages. It seems natural to assume that we learn words and their meaning together and that when we hear words their meanings are evoked; understanding is no more than being aware of the meanings of the words. Words function in language, the story goes, as symbols or representations of meanings. The word is heard or seen; its meaning is evoked, and understanding occurs.

As we shall see, this seemingly natural set of assumptions about the way words work is inaccurate and can be detrimental to the development of instructional materials. Words do not function as referents of objects or meanings, rather, words act as cues on the basis of which we construct meaningful interpretations of messages or interactions. For example, the words "How are you?" can mean a wide variety of things depending upon how they are said and the context in which they occur. Frequently, we assume that, "how are you" is not really a question in need of an answer, but a form of greeting that can vary from friendly to coldly polite. In the situations where it is in fact a question, it can have many meanings such as: "Are you feeling better now?" if you have been sick, or "Can you continue?" if we are doing something difficult, or a complaint if I haven't heard from you in a long time. In each case the meaning

of the phrase can be determined by several factors. The listener figures out possible meanings of the phrase using: 1) his knowledge of what is happening between the speaker and himself; and 2) his knowledge of how this might relate to other relevant experiences or aspects of their relationship. The words do not evoke a given set of meanings, rather they act as cues to possible meanings. If you play the game of changing contexts, changing relations between people, and changing the demands of the situation, you can create a seemingly endless set of meanings for the phrase "how are you?" How can this be so? How can words work if the possible meanings they evoke can form such a long list? How does the head keep a record of so many possible meanings for the thousands and thousands of words we know? The answer, as we shall see, is that the meanings are not stored. Rather, the meanings are created in the different situations. Words act as cues for this creation, they do not stand for a list of meanings which are evoked as the words are experienced.

Read the following words slowly with the knowledge that you will be asked to remember them in a few minutes: pillow, spread, bed, rug, slippers, yawn, book, pajamas, dresser, light, robe, awake, alarm, sheet, blanket. Now write down as many of the words as you can remember. About 50% of my students who hear or read this list later remember the word "sleep." "Sleep" however, was not in the list of words. This is not a surprising result if we assume that the words led people to imagine or to construct in their minds a situation or series of events that would occur in a bedroom. Many of these constructions could involve sleeping, or falling asleep, or waking up. If the act of sleeping was a part of the construction then it makes sense to remember or think you heard the word "sleep." The words acted as cues on the basis of which you created possible or likely mental constructions. What you tend to remember is the construction, i.e., what your head builds, not just a copy of the list of words. Consider now what it means to have understood those words. Understanding was an active process, the creation of mental events. It is this active building of mental events which characterizes comprehension. What we understand depends upon the events we construct, and what we learn is contained in these mental constructions.

Similarly, when we listen to people talk or when we read sentences and paragraphs we are rarely able to recall the exact words that were used. What we are usually very good at remembering is the meaning of what was read or said. In a cleverly designed series of experiments, Sachs (1967) presented short stories to subjects. She stopped the story and presented new sentences to the subjects asking them if they were identical to sentences in the story or changed in any way. The subjects

were unable to consistently detect changes in the form of the sentences. However, any change that effected the meaning of the sentences was detected 80% to 90% of the time.

For example, consider the following five sentences actually used by Sachs.

BASE (unchanged):

A wealthy manufacturer, Matthew Boulton, sought out the young inventor.

SEMANTIC CHANGE:

The young inventor sought out a wealthy manufacturer, Matthew Boulton.

ACTIVE TO PASSIVE CHANGE:

The young inventor was sought out by a wealthy manufacturer, Matthew Boulton.

FORMAL CHANGE:

A wealthy manufacturer, Matthew Boulton, sought the young inventor out.

LEXICAL CHANGE:

A rich manufacturer, Matthew Boulton, sought out the young inventor.

The "base" sentence was in the original story. If forty seconds or more had passed since the subject heard the base sentence, the passive/active, formal, and lexical changes were not detected at a level different from chance. In contrast, the semantic change was consistently detected as different. That is, the changes which altered the form but not the meaning of the sentences were difficult to detect, even when this involved changing the exact words used. However, changes in form which also changed the meaning were easily detected. Sach's subjects had knowledge of the meaning of the passages, but they had little knowledge of the exact words in the sentences or the form of the sentences. The words in the Sachs' paragraphs acted as cues for the building of mental constructions and what the subjects tended to remember was the mental construction they had built. Clearly, when we listed to or read words we do not learn copies of the words or sentences themselves, rather we learn the meanings that we construct. Studies such as Sachs' illustrate that the words somehow act as the basis for mental construction and that what we know or remember are these constructions. It is not the case that we remember sentences and repeat them back again so we can remember what they meant. The meaning that sentences have for us are the mental constructions we create when we experience the words.

Bransford, Barclay, and Franks (1972) discuss a series of experiments which investigate the nature of these constructions. Consider

the sentence "Three turtles were sitting on a log when a fish swam beneath them." Subjects who heard this sentence later believed that they had heard sentences which said the fish swam under the log. The event of the fish swimming under the log is implied in the original sentence and would, therefore, be in our mental constructions about the sentence. It is important to note, however, that the event is not described in the sentence or contained in the meaning of the words in the sentence. The event of the fish swimming under the log is implied given what we know about turtles, water, logs and fish and how these objects can interact. It is not contained in the meanings of the words. If we have the appropriate knowledge we can use the words as cues to build a mental construction. What is contained in these constructions goes beyond the meanings of the words used. The event of the fish swimming beneath the log is contained in an appropriate mental construction, not in the meanings of the words in the sentence.

In a related experiment Johnson, Bransford, and Solomon (reported in Bransford and McCarrol, 1975) found that after hearing the following sentences: "John was trying to fix the birdhouse. He was pounding the nail when his father came out to watch him and help him do the work:" subjects frequently believed that they had heard a sentence containing the word "hammer." Again, note, that "hammer" is implied only if you have the appropriate knowledge. In other times or cultures "rock" could have been implied by a similar sentence. Hammer is implied for us because of our knowledge about tools, birdhouses, etc., and it is not in the meaning of the words in the sentence.

To review, understanding is not the awareness of given meanings which we store and bring to mind when the word is experienced. Rather, words act as cues allowing us to create semantic constructions on the basis of knowledge we have about the words, the situation, the objects involved, and the possible interaction of these factors with each other. As the above examples have shown, the content of the construction is more than what is contained in the meanings of the words. The content of the construction depends upon what the listener contributes, it is not predetermined by meanings which are evoked when the words are heard.

If comprehension and learning are to occur, instructional materials and strategies must act as successful cues for the building of mental constructions. To act as successful cues, the instructional materials must direct the learner to knowledge that he already possesses. He can then use this knowledge to build the appropriate constructions.

To this point we have discussed evidence suggesting that words act as cues to allow us to build mental constructions. Now I would like to turn to a consideration of the factors necessary for this construction to

occur. John Bransford and his colleagues have conducted a series of experiments investigating some of the limitations upon peoples' ability to understand and recall verbal material. Consider the sentences: "The trip was not delayed because the bottle shattered. The haystack was important because the cloth ripped." At first, these sentences sound like nonsense and are difficult to remember even a few seconds after they are heard. McCarrol, Bransford, and Johnson reported in Bransford and McCarrol (1975) that subjects were extremely poor at recalling sentences such as these and found them exceedingly difficult to understand. However, the same sentences were not difficult to remember or understand when preceded with appropriate contextual cues: (christening a ship) "The trip was not delayed because the bottle shattered." (parachutist) "The haystack was important because the cloth ripped." When the sentence occurs in a context that provides the listener enough information to create a semantic construction, understanding and memory are relatively easy. When the conditions are such that the necessary information is not present, exactly the same words seem terribly difficult to understand and remember. If understanding was simply a matter of having words evoke meanings, the sentences would be equally understandable with or without the contextual cues. In this case, the listeners knew the meanings of the words in the sentences and had relevant knowledge about the subject matter of the sentences. Yet, they still failed to understand or remember. The sentences did not act as successful cues for the building of appropriate semantic constructions because they did not make it clear which aspect of the listeners knowledge was relevant. Understanding is not automatic even when the problems of word meaning and background knowledge can be assumed to be satisfactorily solved. If an appropriate construction is not built, understanding can not occur.

It is also important to note that the effectiveness of the contextual cues depends upon what the listener already knows. The cues can be helpful only if he has relevant knowledge to which he can refer. It is possible for someone to know the meaning of the words in the sentences and not have knowledge of christenings. In that case the meanings of the words would not be a sufficient condition for understanding the sentence even if the contextual cue (christenings) was present. Understanding entails the successful creation of semantic constructions. The building of appropriate constructions can only occur if the learner has relevant knowledge and knows which aspect of his knowledge is needed in a particular situation. The words don't provide the meaning for the utterances, rather they act as cues for the creation of meaning.

Finally, consider the following paragraph:

> The procedure is actually quite simple. First you arrange things in different groups. Of course one pile may be sufficient depending on how much there is to do. If you have to go somewhere else due to lack of facilities that is the next step, otherwise you are pretty well set. It is important not to over-do things. That is, it is better to do too few things at once than too many. In the short run this may not seem important but complications can easily arise. A mistake can be expensive as well. At first the whole procedure will seem complicated. Soon, however, it will become just another facet of life. It is difficult to foresee any end to the necessity for this task in the immediate future, but then one never can tell. After the procedure is completed one arranges the materials into different groups again. Then they can be put into their appropriate places. Eventually they will be used once more and the whole cycle will then have to be repeated. However, that is a part of life.

This paragraph was used in an experiment conducted by Bransford and Johnson (1974). Subjects showed poor comprehension, and very little ability to recall the words in the paragraph. The problem in understanding this paragraph is not a problem of word meanings. We all know all of the words in the paragraph. The difficulty in understanding this paragraph is a problem of creating a semantic construction which fits the paragraph. Read the paragraph again with the knowledge that it is about the task of washing clothes. Now the same words can provide you with a completely different experience. Notice how you are constructing situations, objects, and relations in your mind. For example, what is the mistake that could be costly? This demonstration shows that the meaning of the words, the meaning of the sentences, and the meaning of the paragraph all depends upon the listener being able to construct a semantic interpretation. When the listener fails at this task, the prose seems to have no meaning. It is not a sufficient condition for understanding that we possess relevant knowledge. All of us possess enough knowledge about washing clothes to understand the paragraph, but we must know what part of our knowledge is relevant to that understanding.

We have seen that words do not have meanings which are stored in the brain and evoked when the word occurs. Rather, words act as cues to the construction of meaningful interpretations which fit the situation in which the words occur. Words act as cues to semantic constructions by directing the listener to knowledge that he already has about objects, events, etc. Understanding consists of using this existing knowledge to build appropriate constructions. These constructions, then, are new knowledge which builds upon what is already known. We use existing knowledge to create new knowledge. Instructional materials and

strategies can only be successful to the degree that they direct the learner to relevant existing knowledge, and lead him to use this knowledge to create new knowledge, i.e., sematic constructions.

IMPLICATIONS FOR INSTRUCTIONAL DESIGN

In the above discussion of the nature of comprehension we described comprehension as an active, constructive, contribution of the comprehender. Understanding was shown to involve the building of mental constructs. When the learners failed to build these constructs little was understood or remembered. To be successful, instructional materials and strategies must be directed toward this goal. Frequently, we learn things through repetition and are able to say them back on cue, but do not really understand them. Many children learn the rhyme: "Mares eat oats and does eat oats and little lambs eat ivy," without becoming aware that the words are meaningful English words. Rather, they learn it as a pleasant sounding rhyme or tune and are not at all cognizant that it is about animals or eating.

In a certain sense, these children have learned the rhyme, that is, they are able to say it back. However, they have not understood the rhyme: they have not acquired the information about what animals eat what. As instructional material about animals' eating preferences, the rhyme was a total failure, even though the children "knew it by heart." Memorizing the rhyme did not insure that it was understood, or that its implications could be grasped (for example, realizing what animals could endanger your ivy plants.)

To understand requires more than making a record or copy of what we have experienced. Understanding requires that we use what we already know to build the mental constructs that contain the new information. What we understand and know is in these constructions, not in copies of what we have experienced.

There are several typical ways that instruction fails when the active contribution of the understander is not acknowledged. In the remainder of this chapter we will discuss three typical instructional errors which occur because of misunderstandings about the nature of comprehension. The first two errors are a result of equating word meanings with knowledge. That is, assuming that word meanings entail the knowledge necessary for understanding.

As we have seen in this chapter, knowing the meanings of words is not the same as understanding those words in a particular situation. Words do not automatically evoke the meanings associated with them; rather, they act as cues which direct us to relevant parts of our knowledge of the world. We then use this knowledge of the world to construct possible meanings of the words in a given situation.

If I say to you "That man is like a giraffe," and he has just been stretching his neck to see over a fence, you will probably assume he has a long neck. But, in fact, I can use the same words to direct you to any knowledge you might happen to have about giraffes. The man may be wearing shorts and have skinny, long legs; he may have on a spotted pair of pants, or chew his food in an unusual manner, or be unable to speak. In fact, the words can direct you to any knowledge you have about giraffes, and their relationships to other objects or events. For example, the sentence could refer to a giraffe on ice, if the man is learning to skate, or a giraffes' relation to objects like trees if the man is able to reach high places. Depending upon the situation in which they occur, words can direct us to virtually any knowledge we have or to any relationship we can imagine.

In the above example, knowing the meaning of giraffe does not insure that you will know the meaning of the sentence. Understanding the sentence depends upon your knowledge of giraffes and how they can potentially relate to other things, plus your knowledge of the current situation.

As the above example shows, the relation between words and our knowledge of the world is not rigid and set, but rather, involves a complex, flexible type of problem solving. Understanding is not and can not be a passive taking in or recording of experiences. Understanding always involves an interaction between knowledge of the words and knowledge of related events. Understanding can not occur if we are not familiar with the word used. Conversely, understanding can not occur if we do not have the appropriate knowledge to make sense of the words in a particular situation.

Unless we are aware of this interdependence of knowledge of words and knowledge of the world, it seems natural to assume that understanding will occur automatically if we know the meanings of words. Based upon this assumption, two related instructional errors frequently occur. First, materials often teach vocabulary without providing the background knowledge necessary for understanding. Second, the contents of instructional materials are frequently not understood because the designers assume that a familiarity with their vocabulary is all that is required for understanding them. In both of these cases, instructional materials fail because they assume a given vocabulary is a sufficient condition for understanding to occur.

The third type of design error to be discussed occurs when instructional materials actually interfere with the building of the semantic constructions necessary for understanding. Typically, this happens when the ability to perform a task is confused with the understanding of a concept or principle. Examples of the first type of error are easy to find.

Frequently, learners will be taught the vocabulary of a subject area, but not given the information or experience necessary for them to do the construction involved in understanding related statements or problems. The result is a set of words or facts that are memorized, but not understood. William James in his book *Talks to Teachers* gives a famous example of his failure to understand the contribution of the learner. While visiting a class, a friend of James' asked the students, "if you dug a hole hundreds of feet deep into the earth, would it be hotter or colder at the bottom of the hole?" The student said they didn't know. The teacher replied: "I am sure they know, but I think you don't ask the question quite rightly. Let me try." She then asked, "In what condition is the interior of the globe?" The class responded at once in unison, "The center of the globe is in a state of igneous fusion."

In fact, they knew the vocabulary, but did not have knowledge relevant to the problem. That is, they did not have the knowledge necessary to build semantic constructions relevant to the problem. As we saw in the earlier examples, knowledge of vocabulary is not a guarantee of the ability to do the construction necessary for understanding to occur. Learning the vocabulary of a subject matter need not include learning the information necessary to build relevant constructions. The words don't have meanings which are evoked when the words occur. The words only act as cues for the building of semantic constructions. If the learner doesn't have the necessary knowledge, he cannot create the semantic constructions. If he cannot create the semantic constructions, he cannot understand. The words only act as cues to the building of meaningful interpretations, they do not carry the meaning. To solve the problem the students needed to understand that the earth is shaped like a ball, that as with a ball, when you dig straight down you approach the center, and that the center of the earth contains molton rock. If they had relevant experience, they would then understand that this molton rock would necessarily be extremely hot and, therefore, they would be able to conclude that as you approached this heat source it would become warmer. This knowledge which is needed to solve the problem is not contained in the word meanings in the statement: "The interior of the globe is in a state of igneous fusion." Memorizing this statement or a related vocabulary does not necessarily mean that understanding will occur. To understand the problem posed to the class, a great deal of knowledge of the world is required, knowledge which is not automatically carried by the words or vocabulary items. Often the development of the vocabulary of a content area is given too much attention, while little time is spent developing experiences which provide the required knowledge.

The first type of error, the teaching of vocabulary in the absence of the knowledge necessary for constructive understanding, has an equally nonproductive counterpart; that is, making the assumption that if the vocabulary used is familiar to the learner then understanding will automatically occur. This assumption, at face value, seems natural and reasonable until we consider again the nature of comprehension. Understanding entails being able to make appropriate mental constructions. Usually, the building of these semantic constructions requires a great deal of information not included in the words or sentences making up the instructional materials. In the "building of a birdhouse" example cited above, people frequently thought that they had heard the word "hammer." Their understanding of the sentences was based upon knowledge of hammers, nails, wood, birds, birdhouses, etc., knowledge that was not included in the sentence. If they had not had this extra knowledge they could not have understood the sentences in the same way. To be understood, words must be in the vocabulary of the learner and they must direct the learner to relevant knowledge he has about the topic or issue being referred to. If he has no such knowledge, understanding will not occur. It is, therefore, possible to be familiar with the words used in instructional materials and still not understand the information the materials were designed to convey.

Consider again the sentence. "The haystack was important because the cloth ripped." This sentence is difficult to understand. However, this difficulty is not due to the difficulty or lack of familiarity of the words in the sentence. The sentence is difficult to comprehend because it does not contain enough information to allow us to build an appropriate semantic construction. If we consider this sentence in the context of a parachutist, it is not difficult to build an appropriate construction. If we did not have knowledge of parachutists, parachutes, the speed of free falling objects, etc., the sentence would be impossible for us to understand even though the actual words in it were all familiar to us. Designing instructional materials using a vocabulary level appropriate to the learners is of course a necessary part of instructional design. However, it is only a first step in making the materials understandable to the learners. The learners must have knowledge which can be related in some way to the content of the instructional materials.

It is also possible for the learner to possess appropriate knowledge, i.e., knowledge relevant to the content of the instructional materials, and not be aware of what part of his knowledge he should apply. In the "Washing Clothes" example discussed in the first part of this chapter, we all had the knowledge which could have enabled us to understand the paragraph. However, it was not until we were aware of what aspect of our knowledge was relevant that we were able to understand the

paragraph. If we do not know how our existing knowledge relates to what we are experiencing, then we can not build semantic constructions, and, therefore, understanding does not occur.

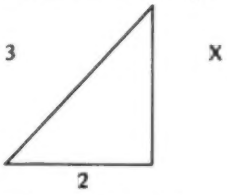
Frequently, instructional material actually interferes with the learners' development of semantic constructions; this is the third type of instructional error we will discuss. Consider the following example taken from George Millers', *The Psychology of Communication.*

> Imagine that you are teaching geometry to children. You have covered the business of calculating the length of the hypotenuse of a right-angled triangle when the base and the altitude are given. Now you are about to take up the problem of finding the *area* of a right triangle when the base and the hypotenuse are given. Suppose you were given your choice of the following two methods of teaching the children to solve the problem. In method A you would help them to discover that the area of a right triangle is half that of a rectangle with the same base and altitude, that the unknown altitude of the triangle in this case can be calculated from the given base and hypotenuse by use of the Pythagorean theorem, and that the area of the triangle can therefore be found by deriving the altitude, computing the area of the rectangle and then taking half of that. In method B you would simply tell the class to memorize six steps: 1) add the length of the base to the length of the hypotenuse; 2) subtract the length of the base from the length of the hypotenuse; 3) multiply the first result by the second; 4) extract the square root of this product; 5) multiply the positive root by the length of the base; 6) divide this product by two.

Method B is an extreme example of how an attempt to be precise and spell out each step in detail can actually interfere with the learner's development of semantic constructions. This procedure for solving the problem does not help the learner to see the relation between the triangle and the related rectangle or the relation of the sides of the triangle to the hypotenuse (see Figure 1). It is this set of relations that must be understood if the learner is to understand the solution to the problem. Following the instructions does not lead to the development of those semantic constructions which are crucial to an understanding of the solution to the problem or to related problems. In fact, following the steps requires such concentration that the student's attention is actually distracted from those aspects of the problem which must be grasped in order for comprehension to occur. All of the learner's effort and attention is required to follow each step exactly and he is actually prevented from building the relevant constructs. In addition to taking up all the learner's

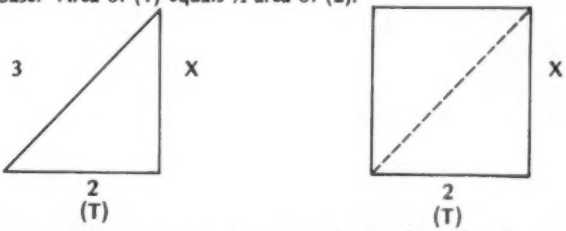
Figure 1. Problem, knowledge relevant to solution, and solution of problem. (See text for discussion.)

PROBLEM: What is the area of this triangle?

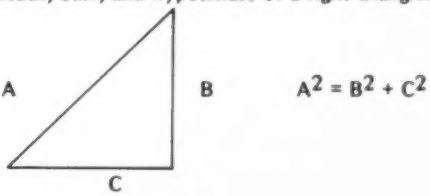


Knowledge crucial for understanding solution:

1. Relation of area of triangle to area of rectangle with identical altitude and base. Area of (1) equals ½ area of (2).



2. Relation of altitude, base, and hypotenuse of a right triangle.



SOLUTION:

A. With knowledge of 2 you can find the altitude, i.e., side X.

B. With knowledge of 1 you can find the area of the right triangle.

time and attention, the steps also disguise the principles underlying the steps so well that the learner is unable to tell how the steps relate to things he already knows. This procedure is unsuccessful because it distracts the learner from what must be perceived, and it provides no information about what part of the knowledge already possessed is relevant to the solution of the problem. This is not to deny the importance of an analysis of the material into small manageable parts. However, this can be self defeating if the learner is not able to grasp relations between the units or see the purpose of the steps.

Consider the instructions for filling out your income tax forms. These instructions work, in that if you follow them carefully you will be able to complete the task. However, these instructions do not give you much information about what you are doing or why. The steps involved in doing a task need not convey any understanding of what has been done, unless that understanding itself is a desired outcome. But it is important to keep clear the difference between instructions telling how to do a task, such as the assembly of a toy or a piece of furniture, and instructions designed to convey an understanding of what is involved in the solution of a problem or a set of similar problems.

Shaw and Wilson (1976) demonstrated that it is typically the abstract relations or principles underlying instances of concepts that are acquired by learners. These abstract relationships are what allows the learner to use what he has learned in new related situations. Instructional materials which distract the learner from these relations or hide them from him can not be understood in a useful manner.

Figure 2. Scissors.

Next, consider the scissors shown in figure 2. (This figure is taken from Bransford and McCarrol, 1975). Suppose we are assigned the task of developing instructional materials to teach people to correctly identify each of the give types. One procedure would be to develop criteria or define characteristics which when learned would allow the learner to

identify each of the types of scissors. Typically, characteristics such as size of blades, size of handle, shape of blade, shape of handle, shape of blade tips, and weight, might be used. The learner would then be required to learn the six defining characteristics of each type. Once the characteristics of each type had been acquired the learner would have a foolproof set of procedures for identifying the five types of scissors.

What is wrong with such a set of procedures? It is clear that this system once learned would in fact allow the successful identification of the scissors. However, there are a number of problems with such a set of procedures. First, the task of memorizing the six characteristics of each type seems artificial and boring. This is because we have developed instructional materials which do not encourage the building of semantic constructions. We have developed an artificial set of characteristics which do not relate in any apparent way to other knowledge the learner might have. If his knowledge is not relevant or he does see how it is relevant, then he cannot build the constructions which together constitute understanding. That is, he cannot conceptualize the various types of scissors. He is left to the dull, tedious task of memorizing the six criteria for each of the five types.

An alternative would be to develop instructional materials which would allow and encourage the learner to use his existing knowledge to build constructions concerning the given types and their relationships to each other. For example, we could develop materials leading the learner to infer or discover the relation between the structure and function of the scissors. The heavy scissors with the lower blade flush to a surface and with an unusually large finger hole are for cutting cloth. They are heavy in order to cut heavy material, the blade and handle are designed to allow them to slide along a flat surface as they cut, and the large finger hole allows more fingers and therefore stronger pressure to be applied for cutting blades. Now look at the other types; which might be safe for small children? How would large finger holes be helpful to children? Which scissors would be good for cutting hair? Why? Now the learning of the different types seems to progress in a sensible, easy, and straightforward manner. Your existing knowledge is useful and you know which parts of your knowledge are relevant. Now, the task seems so easy as to occur almost automatically. But if you look carefully, you will see your mind at work building constructions, constructions which include the relationships between the uses of the scissors and their principles of design. This understanding does not come automatically, and can come at all only because the constructive process can make use of the existing knowledge you already have. If you were from another culture and did not have the relevant knowledge, you would once again be in the position of memorizing unrelated facts.

Too much of what we teach people is taught as isolated facts that don't relate the rest of their knowledge. I have interviewed children who had recently finished a 6th grade science curriculum. When asked about cells, they seemed to have learned a considerable amount. They know about cell walls, cell nuclei, and the division of cells. However, when asked about where cells were, and what things had cells, they looked at me with a blank stare. Clearly, they had no idea which part of their already existing knowledge was relevant to the information they had been learning about cells. They had not used relevant aspects of their existing knowledge in building their constructions about cells. The constructions that were built were not related to other things the children knew.

In each of the three types of errors discussed, the instructional materials failed because the learner did not build an appropriate semantic construction. In the first type, the learner is taught vocabulary items while little attention is paid to the teaching of relevant background knowledge. Without the relevant background knowledge he is unable to build the necessary semantic constructions. In the second case, he is unable to build the appropriate constructions even though the words are familiar to him, because he does not have the necessary background knowledge which would enable him to understand the context of the materials. In the third case, the instructional materials actually prevented the learner's development of appropriate constructions.

In some research recently conducted at Governors State University (Wilson, Hilligoss and Vasto, 1977) we conducted a strong test of the necessity of semantic constructions for learning. We gave two groups of students the same list of sentences to learn. The sentences were short and expressed simple facts such as "Uncles are male." and "Squares have corners." All of the words in the sentences were common English words. Students in one group were given instructions designed to prevent them from building semantic constructions. As they read each sentence this group checked to see if the nouns in the sentence rhymed. Another group of students was given a task designed to encourage the building of semantic constructions. As these students read each sentence, they were asked to rate the contents of the sentences, as pleasant or unpleasant to them. Presumedly, rating the contents of these sentences referring to uncles as pleasant or unpleasant caused the learner to think about an uncle of his, or an imaginary uncle, or an uncle in a story, etc. This is the building of a semantic construction. Later, both groups were given the sentences in the form "_____ are male" and asked to recall as many of the subjects of the sentences as possible. Members of the group who

performed the task designed to interfere with the formation of semantic constructions could recall only about 4 of the 50 subjects. In contrast, members of the group who performed the task encouraging the development of semantic constructions were able to recall more than 30 of the original sentences. This is a striking result when it is noted that both groups of students experienced the same set of sentences the same number of times (once) and for the same amount of time. The acquisition of simple facts, presented in small units, and in a simple vocabulary, failed to teach when semantic constructions were not built.

We have seen that 1) understanding is a problem solving activity which entails constructing semantic interpretations. 2) To be successful at this task the listener must have appropriate background knowledge and 3) must know what aspects of this knowledge are relevant to the understanding of the material at hand. Knowing the meanings of words used in the material is not a sufficient basis for understanding prose. The problem is not simply a vocabulary problem. Rather, the problem of understanding is one of satisfying sufficient conditions for the construction of semantic interpretations to take place. To be successful, instructional strategies and materials must bring the learner to use his knowledge to develop these mental constructions.

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CHAPTER V

SELECTION AND EVALUATION OF ALTERNATIVE TEACHING METHODS IN HIGHER EDUCATION

By

Dean N. Osterman

INTRODUCTION

Five non-traditional teaching methods are presented in this chapter. A process for matching an instructor and course to an appropriate method is described. Finally, an evaluation matrix, an instrument which has proved useful in conducting the selection process, is presented.

The purposes of this chapter are:

1. To provide a framework within which to explain why faculty in higher education are seeking alternatives to the lecture form of instruction;
2. To provide a description of the College and University Teaching Project (CAUT) at Oregon State University;
3. To describe five effective alternative teaching methods used in higher education;
4. To list the advantages and disadvantages of each instructional method;
5. To describe a selection process; and
6. To provide a teaching method evaluation matrix derived from the literature.

1. Why are Faculty Seeking Alternative Teaching Approaches?

College and university teachers are turning to alternative approaches to the conventional lecture as a means of teaching students. This response is being triggered by the increased demand by students for a "better education." This, in turn, is stimulated by the demands of employers for graduates to begin their employment prepared for work, already possessing required operational skills and knowledge. Other pressures to consider alternative teaching methods derive from considerations such as cost-effectiveness (reducing the cost to educate the student), the specification of minimal standards and competencies that must be reached by all students, administrative review and evaluation of teaching performance, faculty peer pressure, and student feedback.

The lecture method is being challenged as an effective means of teaching college and university students to function on the higher

cognitive levels; that is, at the analysis and synthesis levels. A review of the vast research literature, comparing the lecture with other forms of instruction, indicates that the lecture has only a marginal value in certain areas of the teaching/learning process. (Costin, 1972) "Lectures were once useful; but now, when all can read and books are so numerous, lectures are unnecessary. . . ." (Boswell, 1881) "As a means of imparting information, especially if habitually used, the formal lecture is probably the most *ineffective* and wasteful of all methods." (Schueler, 1951)

As instructors study their teaching performances and search for means to stimulate cognitive learning at higher levels, they often seek alternatives to the lecture method. "A suspicion arises, supported by bits of evidence, that other methods of teaching may be more effective than lecturing in achieving some of the higher level cognitive and attitudinal objectives." (Weston, 1951)

The concern at this point is to select an approach that will best serve the needs of the teacher and students rather than just replacing an "old idea" with a new one. ". . . The pressure to 'invent' the new methods are no longer adequate to our needs." (McKeachie, 1967) Before leaping into new styles of teaching, it is advisable that the instructor select an approach by using some sort of criteria. In responding to this need to introduce faculty to alternative teaching approaches, a handful of colleges and universities have created faculty training and developmental workshops or clinics. Faculty, as participants, are exposed to instructional design, development, and evaluation procedures as well as a number of alternative approaches to teaching which might meet their needs. One of the universities that provides such a program is Oregon State University. The following information describes the OSU program.

2. The College and University Teaching Project (CAUT)

As part of the Faculty Development Program at Oregon State University, the College and University Teaching Project (CAUT) is designed to provide instructional design, development, and evaluation services to the OSU faculty. These services include consultation and media resources support. Also included is an intensive one-year program during which participating faculty work with consultants in carrying out instructional design activities leading to course improvement and to the implementation of innovative teaching/learning strategies.

The CAUT Project was created in 1974 by the Dean of Undergraduate Studies in an attempt to provide instructional design facilities and programs for the faculty. The primary purpose of the program was to aid in the establishment of an atmosphere within which faculty

members would be motivated to explore and implement innovative teaching strategies. This was felt to be necessary due to the fact that, on the OSU campus, the prevailing reward structure favored research efforts, not teaching improvement. (Miller, 1974) It was believed that this program provided the best available vehicle for introducing faculty members to teaching methods which might serve as alternatives to the traditional lecture approach.

This plan accommodates the various academic and instructional interests, backgrounds, competencies, and needs of the participants. It was recognized that faculty would enter the CAUT Project with a myriad of problems and experiences. "All teachers are not at the same place on any continuum of improvement." (Meeth) The common interest bonding the faculty members together is a recognition of the instructional needs of the students. Once the faculty relate to this common link, they see one another as teachers of students and not so much as teachers of disciplines.

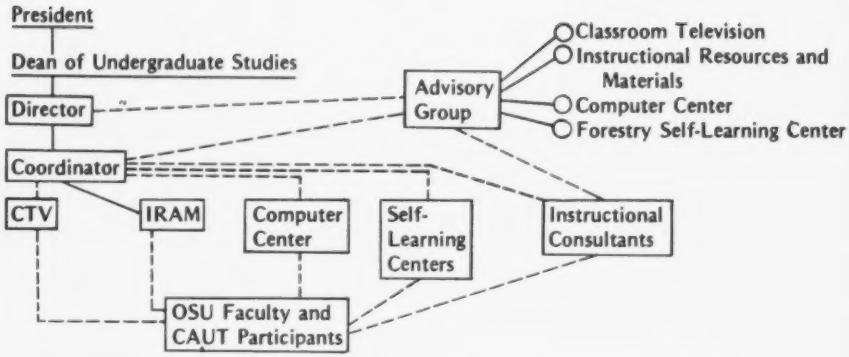
How the CAUT Project Works

The CAUT Project consists of a full year divided into four distinct phases of instructional activities. Throughout the separate phases, incentives in the form of stipends, some released time, administrative support, specific workshops, and other motivational procedures are offered to maintain an atmosphere conducive to innovation. Using interpersonal communications and the input of selected outside instructional consultants, the faculty participants are introduced to instructional planning and to selected alternative teaching methods. The instructional consultants are selected because of their ability to communicate with faculty on an interpersonal basis, and an atmosphere emphasizing interpersonal communication is maintained throughout the four phases. This approach has been chosen in preference to other diffusion methods as a result of recent research concerning the communication of innovations to the faculty. (Osterman, 1975)

Administration and Coordination

The CAUT Project is administered and coordinated by the Dean of Undergraduate Studies, the Director and the Coordinator of the Project. An advisory committee provides advice concerning the selection of participants and the guidelines for Phase I. The Coordinator is responsible for designing the workshop session; coordinating instructional development activities among project participants, the instructional consultants, and the media service units; and monitoring the project and evaluating the participants' achievements as a result of the project. The following chart illustrates these functions:

Figure 1.



PHASE I: Instructional Sequence

Based upon the evaluation reports of the previous year's CAUT Project participants and the needs assessment of the new participants, a three-week instructional workshop is planned. Filtering through this information, the advisory group working with the Coordinator design the instructional sequences for the workshop.

The CAUT Project staff consult with participants throughout Phase I to 1) provide criteria for the selection and evaluation of the appropriate teaching-learning delivery systems and 2) assist the participants in preparing instructional products. The final selection of the particular alternative to be used in providing instruction is based upon:

- the constraints and limitations that the instructor is facing
- personality of the instructor (shy, open, dominant . . .)
- funding
- types of students (graduate, undergraduate)
- past course surveys and faculty evaluation reports
- learning objectives
- available teaching-learning resources
- experience in alternative teaching approaches, such as Personalized Systems of Instruction, Audio-Tutorial, Guided Design, and others

PHASE II: Design and Development

As the Phase I workshop terminates, a two-month planning period follows in which consultation is provided. Participants work with the CAUT staff to identify problem areas, sequence instruction, state learning objectives, and complete an instructional design for the following academic year. Appropriate teaching-learning approaches are selected and participants begin managing the development of their course. The following chart illustrates the activities of Phase II:

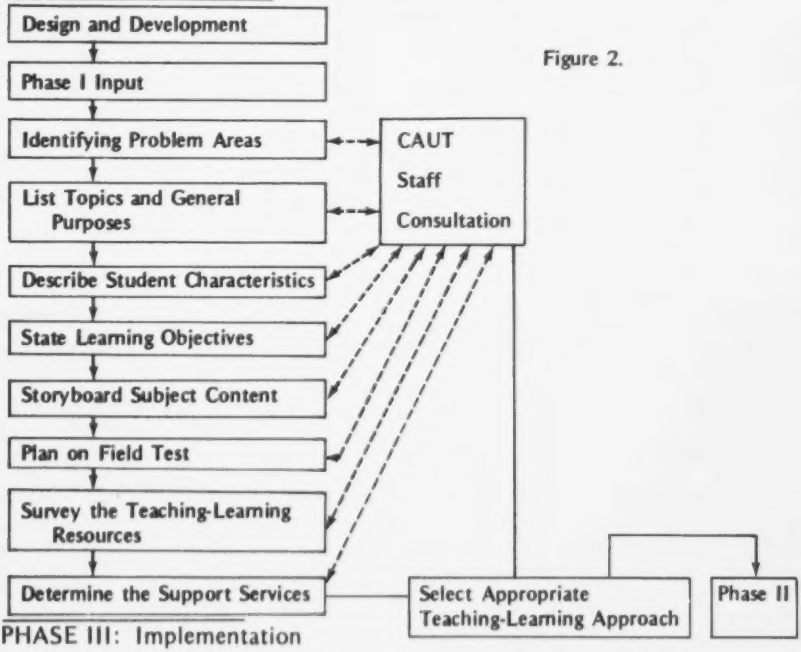


Figure 2.

PHASE III: Implementation

Participants have selected the most appropriate instructional strategies (materials and methods) during Phases I and II. During Phase III, which covers the academic year, these decisions are implemented. This is achieved through the participants' instructional activities and through further developmental work. This usually proves to be the participants' most productive period.

Each participant, working at his own rate and under his own working conditions, develops materials and strategies and applies them in his teaching.

The participants who have operated at a somewhat slower pace, concentrate on improving their lectures by sequencing their oral presentations, adding instructional aids, writing objectives, improving the course

outlines, and constructing test questions with the aid of the computer test analysis services.

Those participants operating at a more intensive rate usually utilize a total systems approach to design the learning activities for their students. Self-pacing modules, tutorial help, diagnostic testing, independent media, supplementary instruction, mastery learning, and review/recycle steps all become familiar concepts to these participants as they progressively incorporate them into their learning system.

As the academic year is completed, most of the participants feel inspired by their instructional improvements. Materials and methods have been developed for classroom use, field-tested and frequently compared with conventional teaching methods. The following chart summarizes the Phase III implementation procedures:

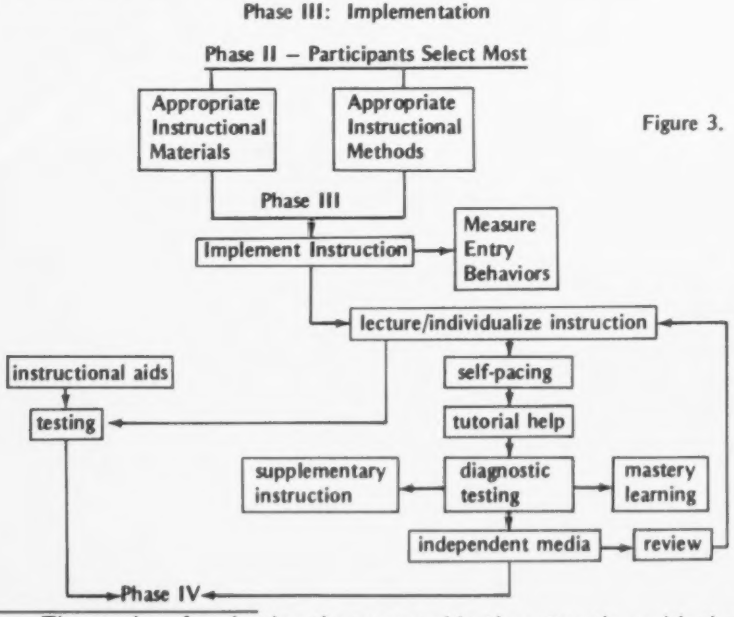


Figure 3.

The results of evaluating the course objectives, together with the overall instructional design, are presented to the CAUT Advisory group, who then determine the merit of the project. The plans are then adjusted for the following year's project.

Feedback is maintained between the participants and the CAUT Project staff during the following year in order to facilitate the development of new courses, the evaluation of instruction and the continuation of other areas of instructional development.

PHASE IV: Project Evaluation

A one day colloquium is held in which the participants report on the progress of their projects. Research concerning the changes in student learning and attitudes as a result of the new teaching approaches is provided by the participants.

Evaluation is reported on two levels: 1) evaluation of the CAUT Project, and 2) student and product evaluation. The CAUT Project is assessed by means of a written questionnaire and through discussions with the CAUT staff. Student evaluations of the course materials and of the teaching methodologies are presented, as are samples of the participants' instructional products.

SUMMARY OF THE CAUT PROJECT OFFERINGS:

Phase I

1. A three-week training workshop in instructional methods and planning.
2. Individual consultation with selected outside consultants and with the CAUT Project staff while carrying out instructional planning and development.
3. An exposure to alternative approaches to instruction.

Phase II–III

4. Seminars throughout the academic year in lecture improvement, test analysis, computer-assisted instruction, formative and summative evaluation, communication skills, use of campus resources, needs assessment, and behavioral objectives. (A curriculum of seminars)
5. Aid in writing funding proposals.
6. Expertise in materials development.
7. Administrative and instructional resource support.

Phase IV

8. Evaluation assistance.
9. Continued support in developing instructional strategies and materials once the 12-month CAUT Project has ended for the participant.

Selection of the Faculty Participants

Faculty are nominated to the CAUT Project by their respective deans and/or appointed by a selection committee. The nominees are then screened and approved by the CAUT Project Advisory Committee. Once a roster of thirty is completed, the participants are invited to attend an orientation meeting which acquaints them with the CAUT staff and presents the objectives and materials of the three-week workshop.

Each participant entering the project will have different needs and approaches to instruction. To meet this problem, five different forms of instruction are presented to all participants. The CAUT staff help the participants to select the alternative teaching approach that best fits their instructional design. These five alternative teaching methods are described in the following sequence.

3. Five Effective Alternative Teaching Methods

The following five approaches to teaching and learning have been selected from several alternatives, since these five best represent those effective teaching methods which are founded upon extensive research findings. Each method is used throughout higher education. No intent is made to refute other alternative forms; obviously it would be difficult to evaluate additional forms within the limitations of this chapter. It is recommended that one attend a complete workshop in the specific method for more complete information.

Brief Description of the Five Alternative Teaching Methods:

Audio-Tutorial Approach to Learning (AT) (Postlethwait, 1972)

The AT system is a tutorial method for guiding students' learning by means of an audiotape format. Using study booths prepared for taped learning activities, the tape directs the student through a unit. The student may be directed to turn off the tape and read a passage in a text, view slides or filmstrips, or examine a few objects placed in the AT booth.

The AT system has three unique components that add flexibility and overall balance to this teaching/learning form. The components are:

1. Independent Study Session (ISS). The students may come in at their convenience and check into a booth. A written set of objectives is issued with the specific unit the student checks out. The student, using headphones, listens to simulated one-to-one tutoring by the instructor. Each student proceeds independently through the unit to achieve the stated objectives for the week. Comfortable surroundings are provided as a means of encouraging students to discuss the units and the subject content. The student leaves when he/she feels satisfied with his/her progress.

2. General Assembly Session (GAS). These large group sessions are scheduled on a weekly basis. Occasional lectures, special films, major exams, and other activities that are best handled in large groups are scheduled for the GAS. Attendance is required for certain special events.

3. Integrated Quiz Session (IQS). This activity involves eight students and the instructor. The activity is scheduled to meet weekly for one-half hour. The main purpose of this session is to have students learn a subject as they teach the session. Each student prepares a small presentation about each of the items used in the ISS. The instructor presents the items in the sequence programmed earlier and selects the student to lecture on a random basis. Each student must organize the subject matter in his own mind, since the instructor may call upon him to respond. The session provides direct feedback, an opportunity for each student to know at least one instructor very well, and a chance for the instructor to know several students well.

Characteristics of the AT System:

1. Emphasis on student learning.
2. Student self-pacing within the weekly unit.
3. Student-directed learning activity.
4. Use of senior instructor.
5. Audio programming of learning experiences.
6. Integrated experiences.
7. Independent study sessions.
8. General assembly sessions.
9. Small assembly sessions.
10. Increased personal contact with instructors.

Computer-Based Education (CBE) (Dyer, 1972)

CBE consists of a broad range of learning activities managed by a computer. The Computer-Assisted Instruction (CAI), a limited meaning of CBE, is a reference to those programs where the computer is used to interact tutorially with students as they move through instructional sequences or courses. Students interact with the computer at low to high levels of learning, using the computer for remedial and advanced study. Systems such as PLATO offer students a wide variety of programs in simulated activities. By applying their knowledge, students can elect a President, clean a dirty river, land a space ship, control a mouse, and other programmed exercises.

CBE characteristics:

1. Simulation and feedback.
2. Test banks.
3. Wide range of materials (software).
4. Instant feedback.
5. Tested theories of learning.
6. Immediate access to information.
7. Individualized and group instruction.

8. Drill and practice.
9. Tutorial programs.
10. Computer rapport.

Guided Design (Wales and Stager 1976)

Guided Design is part system, part attitude. It reshapes the traditional approach to higher education from the ground up by having students, working in small groups, attack problems rather than masses of cold information. It is based on the conviction that students can be brought to acquire whatever factual or technical knowledge they need as they work their way through an ascending order of well-designed problems. The central idea behind all this is that the student who is actively seeking solutions to problems rather than passively assimilating knowledge will emerge not only better educated but far stronger intellectually.

The learning process in Guided Design revolves around students' efforts to devise solutions for a series of increasingly complex open-ended problems. While there is no single correct answer to any of the problems, each requires students to put into play certain kinds of information and skills in order to decide upon a feasible solution. The professor selects the problems according to the skills and content he or she wants the students to learn.

The manner in which students deal with the problems is carefully programmed. Each problem is broken down into sequenced stages or steps. Students must deal with each stage in sequence and are not permitted to progress to a new stage until they have adequately considered and dealt with the preceding stages.

Students work in groups of four to seven members, and it is as a group that they formulate their plan for tackling each stage. As a result of the professor's selection and sequencing of the problem, the group quickly discovers that certain kinds of information are needed in order to make appropriate decisions. These needs have been anticipated by the preparation of a library of materials – traditional and programmed texts, reference books, audiotapes, etc. – which students are free to consult.

The group may divide the task of searching for required information among its individual members. However, the information so gathered is always brought back to the group. Thus, optimum conditions for group problem-solving, with its give and take of ideas, insights, and opinions, are created.

When the group has decided upon its action for the stage of the problem under consideration, it is given written feedback materials, prepared in advance by the instructor. These materials discuss a number

of possible decisions the group may have reached at this point in its problem-solving, elaborating upon the strengths and weaknesses of each. The students compare the pros and cons of their decision with those of other decisions they might have made. Following this evaluation, they are allowed to advance to the next stage of the problem.

Characteristics of Specifically Guided Design:

1. A focus on developing the students' decision-making skills.
2. Teaches specific concepts and principles.
3. Use of Instructional Feedback.
4. Students working in small groups to solve meaningful open-ended problems.
5. Students thinking logically, gathering information, communicating ideas, and using decision-making steps.
6. Teachers serve as consultants, guides, promoters of learning, and managers.
7. Students doing the thinking, making value judgments.
8. Organized disciplines.

Learning Packages (Kapfer 1973)

Learning Packages are known by several names: Learning Activity Packages – LAP, Individualized Learning Packages – ILP's, Teaching Learning Units – TLU's, and UNIPAC. The simplest definition of a learning package is a systematic way of delivering content and process to learners. The common elements of the various types of learning packages are:

1. Pre-test: designed to determine readiness, prerequisites, and student need for the lesson.
2. Main concept: stated in a declarative sentence and related to a time element.
3. Component parts (parts to be learned): stated in words or phrases in order to limit the otherwise limitless scope of any declarative sentence.
4. The objectives – written behaviorally with major emphasis on level of proficiency. Related directly to the terminal performance desired for each component.
5. Instructions for selection of activities – the first element of a recycling device.
6. The diversified activities – three or more per objective, diversified for entry and access rather than for reinforcement (may reinforce, however).
7. The self-test: a decision point for the student and a protection against public failure.

8. Post-test: identical to the objectives; the teacher's portion of the mutual contract.
9. Quest – the opportunity to go beyond the objectives learned, under any condition which will be profitable to the student.
10. The field test – an application of the package to determine its success and usefulness.

Personalized System of Instruction (PSI) (Keller and Sherman, 1974)

The five characteristics of the PSI system are:

1. Student self-pacing. Students are allowed to self-pace themselves through the course materials. Unlike AT, students in a PSI course may remain out of step with the weekly objectives and unit materials most of the term. This is because PSI is based upon a recognition of the importance of individual differences in learning and communication skills and, so, the courses are designed in such a way as to allow individual adaptation to the material.
2. Unit-perfection requirement. Mastery learning or unit perfection requirements are an essential concept in PSI. The student must demonstrate mastery of one learning unit befor proceeding to the next. Students are rewarded (reinforced) for mastery of subject matter. In theory, PSI courses give an A (reward) for mastery of unit requirements and an incomplete (no punishment) for failure to achieve mastery. The basis of PSI is reinforcement theory.
3. Use of lectures as motivators. Lectures are used for motivation rather than to convey information. The lectures offer the opportunity to get the entire class together. The instructor has a chance to appear at his or her inspirational best. The role of the instructor in the PSI format is changed from that of lecturer and grader to that of a course facilitator, organizer of materials, and partner in the learning process.
4. Emphasis upon the written word. The stress is primarily upon the written word as a vehicle of instruction. Textbooks, readings, and study guides that program the course into learning units are the main instructional materials. Like AT courses, PSI clearly defines the objectives in the course literature.
5. Use of proctors. The use of proctors is considered to be one of the most important features of PSI. Undergraduate students usually serve as peer tutors. PSI courses place emphasis on personalization.

4. Advantages and Disadvantages of the Five Alternatives

Audio-Tutorial:

(Advantages)

1. The main instructor (best or most efficient) can prepare the audiotapes and serve as the tutor.
2. The learning rate is mostly controlled by the student.
3. The system is designed for success.
4. Course content is flexible to allow for the interests of the students.
5. Efficient use of facilities, staff and student time can be achieved.
6. Students can learn in a comfortable environment.

(Disadvantages)

1. The development of materials, tests and mini-courses takes a tremendous amount of time, initially.
2. Students must assume a greater degree of responsibility.
3. The teacher may feel the loss of authority and control which one might experience through constant lecturing.
4. There is a tremendous quantity of equipment, room, and extras that are necessary to teach the course.
5. Students may feel programmed.

******

Computer-Based Education:

(Advantages)

1. Students have an opportunity to make mistakes without anyone knowing.
2. A wide variety of programs (simulation models) are available.
3. The computer may make provisions for most disciplines.
4. Students receive instant feedback.
5. Concepts learned can often be carried over to vocations.
6. The materials are organized logically.

(Disadvantages)

1. Instructors need thorough knowledge of programming to create their own programs.
2. Students often "fear" the computer.
3. The initial cost is very high.
4. Instructors fear that they will be replaced by the computer.

5. The computer can only be effective if instructors have a clear idea of its potential use.
6. The computer may break down or require "down time" during the lesson.

******

Guided Design:

(Advantages)

1. Guided design brings knowledge alive as the tool of an active mind seeking orderly solutions to complex problems.
2. This approach uses real-life experiences and students can easily transfer the learning to vocations.
3. Students must explore issues using different opinions, inputs, values, and recommendations in the decision-making process.
4. Students learn how to effectively use the decision-making process.
5. Students are resources of knowledge and become very involved in their learning.

(Disadvantages)

1. It becomes difficult to handle classes larger than 35—40 students.
2. Certain facilities will not allow students to break into small groups.
3. Students have a difficult time returning to traditionally taught courses.
4. Instructors must be good narrative writers.
5. Much time is required to create guided design projects.

******

Learning Packages:

(Advantages)

1. The objectives of the packages are obtainable.
2. The packages are fully self-contained.
3. The emphasis is upon performance outcomes.
4. Students can by-pass packages when they already meet the performance criteria.
5. The teacher can check on the student's progress at the beginning and ending of the package.

(Disadvantages)

1. This system requires a keen sense of organization.
2. Packets often need updating, revising, and refurbishing.
3. Students often find the packets very impersonal.
4. The instructor must be a good writer.
5. A good check-out system is mandatory, which requires the teacher to monitor the packages continually.

******

Personalized System of Instruction:

(Advantages)

1. Students may go at their own learning pace.
2. Students may repeat tests until they pass.
3. PSI does not depend on AV equipment which fails frequently.
4. PSI is built upon a positive (rewarding) structure.
5. Students "master" the course materials.

(Disadvantages)

1. Other instructors (non-PSIers) complain about the grade inflation in PSI courses.
2. Students often put the assignments off until late in the term and are given incompletes.
3. The instructor takes on a role often foreign to his make-up, such as a facilitator.
4. Students have difficulty adjusting to PSI at first.
5. The instructor must organize extra tests, tutor's work, student progress checks, and other "busy" work aside from instruction.

******

5. Instructional Methods Selection Design

Here, at Oregon State University's Instructional Resources and Materials Center (IRAM) and the College and University Teaching Project (CAUT), consultation is provided in instructional development. As part of the design of a course, instructors proceed through a selection design with peers and instructional development consultants to determine the most appropriate instructional teaching method.

As part of the consultative process, the instructional consultant designs a needs assessment tool or procedure as a means of ferreting out the specific needs of the students, instructor, department or discipline, and vocational specifications for future employment.

The consultant then identifies the constraints and limitations of the instructor, department, and subject matter. The personality of the instructor is taken into consideration, as well as the characteristics of the students and peer influences.

The consultant, working with the instructor, recommends that learning and course objectives be established as a means of providing clear directions to follow.

A storyboard plan is developed to sequence the instruction. This may suggest such information as how much information is to be covered and the most appropriate order of events.

As a team, the instructor and consultant discuss what funds are available (if the project is going to be extensive), what granting agency is open for application for instructional development funds, and what administrative support is available to back the project.

The next step is to confirm what resources are available to the instructor. A quick check of the campus resources (human and non-human) is carried out in order to gather information for use as a guideline.

Working with past course surveys and evaluation reports in a confidential setting, the consultant reviews the data to determine areas of strengths and weaknesses.

The consultant works with the instructor to assess any positive or negative experiences that the instructor may have had in using any of these alternative approaches. No hard and fast judgments are made at this point; the emphasis is to gather information. No *one* approach is forced upon the instructor; the final selection remains a joint decision.

As a decision is about to be made concerning an alternative approach to teaching, the consultant, using input from the instructor — formulates a list of the advantages and disadvantages of that particular teaching approach. This helps the instructor to select a teaching method which is appropriate.

These decisions and bits of data that have been collected are evaluated by colleagues, administrators, and advisory committees. Their feedback enables the instructor to make his or her final selection. (See Figures 4 and 5).

The next step is to implement the selection, developing units, projects, or mini-courses using instructional design and development criteria and guidelines.

The consultant monitors the development process in order to determine if the instructional methods selected have adequately provided for the needs of the instructor, the students, the discipline, and the university community.

As the instructor plans to develop further courses, this loop (Fig. 4) is repeated.

Figure 4.

INSTRUCTIONAL METHODS SELECTION DESIGN

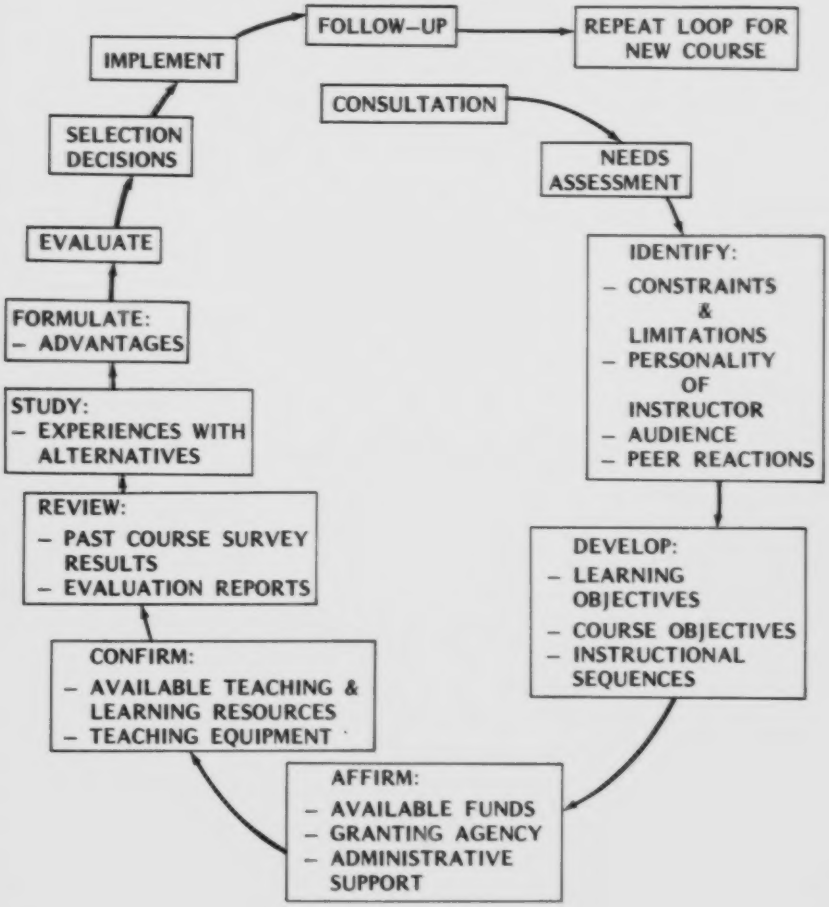


FIGURE 5. EVALUATION MATRIX BASED UPON RESEARCH

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Methods

	A	B	C	D	E	F	G	H	I
	Lecture (conventional)	Lecture with supplementary aids – Films, AV-aids	Feedback Lecture Programmed	AT	GD	PSI	CBE	CAI	LP
1. Student-oriented (control)	low	low-mod	mod	high	high	high	high	high	high
2. Teacher-oriented (control)	high	low-mod	mod	low	low-mod	low	low	low	low
3. Transfer to "real life" conditions	low	low	low	low	high	low	low	high	low
4. Capability to reach high-levels of learning (analysis, synthesis)	low	low-mod	mod	mod	high	low	low	mod	low
5. Capability of handling routine – instruction	low	mod-high	low	high	low	high	high	high	high
6. Degree of student involvement	low	low	mod-high	high	high	high	high	high	high
7. Instructor teaching skill, necessary	mod	low-mod	high	low	high	low	low	low	low
8. Instructional support, necessary	none	mod	low-mod	much	low	low	low	much	mod
9. Cost-effectiveness – time and money	high	mod-high	high	high	high	low-mod (I)	low-mod (I)	low	low
10. Departmental constraints (energy, FTE re-scheduling peer-problems)	little	some	little	much	much	much	much	much	much

FIGURE 5. EVALUATION MATRIX BASED UPON RESEARCH
(Continued)

	A	B	C	D	E	F	G	H	I
11. Favorable for outgoing instructor (overt)	yes	yes	yes	yes	yes	no	no	no	no
12. Favorable for shy instructor (covert)	no	yes/no	yes/no	yes	yes	yes	yes	yes	yes
13. Able to assess students' needs	no	no	yes	yes	yes	yes	yes	yes	yes
14. Preparation time needed	little	little	some–much	much	much	much	much	much	much
15. Transfers decision-making	low	low-mod	low-mod	mod	high	mod	mod	mod	mod
16. Feedback to students	little	low	mod	high	high	high	high	high	high
17. Useful in all disciplines	high	high	high	mod	mod	mod	mod	mod	mod
18. Open-ended problem solving	little	low-mod	mod	mod	high	mod	mod	high	mod
19. Individualized instruction	no	no	no	yes	no	yes	yes	yes	yes
20. Small group instruction	no	no/yes	yes	yes	yes	no	no	no	no
21. Large group instruction	yes	yes	yes	yes	no	no	no	no	no
22. Student retention of concepts over time	little	low	low-mod	low-mod	high	low-mod	low-mod	low-mod	low-mod
23. Specific funding sources available	no	no	no	NSF	Ex-xon	no	no	NSF	no
24. Storage area necessary	none	yes	none	yes	low	low	yes	yes	yes
25. Generates possible solutions	low	low-mod	mod	low-mod	high	low-mod	low-mod	mod	low-mod

FIGURE 5. EVALUATION MATRIX BASED UPON RESEARCH
(Continued)

	A	B	C	D	E	F	G	H	I
26. Instructional development assistance	little	mod	mod	high	high	high	high	high	high
27. Stimulates research possibilities	little	low	mod	mod-high	high	high	high	high	mod-high
28. Amount of instructor's time to gear up	little	mod	mod	much	much	much	much	much	much
29. Popularity within Higher Education	high	average	low	low	low	low	low	low	low
30. Your choice:									

Definitions and Clarifications:

Feedback Lecture, Programmed is a method based upon learning and motivation principles. Objectives of the lecture are written out in advance; students are provided with a study guide for the lecture; active participation on the part of the student is encouraged during "time-out periods" for discussion; the lecture is summarized at the end, and student learning and attitudes are assessed at the end of the lecture.

Letter D = Audio-Tutorial
Letter E = Guided Design
Letter F = Personalized System of Instruction
Letter G = Computer Based Education
Letter H = Computer Assisted Instruction
Letter I = Learning Packages

*The (I) on number nine refers to the initial cost of installing computer equipment.

6. Evaluation Matrix Derived From the Literature*

The evaluation matrix is provided as a guide for providing input to the instructor. (See Figure 5.) The information that is contained in the matrix is based upon findings and taken from various sources. The matrix should not be taken as the final word on teaching methods. Final choices, (see item number 30) may involve more than one of the alternative forms. The author has reservations about a few of the points listed in the matrix but agrees with most of the information.

(*Spangenberg, Riback and Moon, 1973; Klevens, 1975; Cross, 1976; Chu and Schramm, 1967; Bagford, Jones and Wallen, 1976)

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CHAPTER VI

COGNITIVE STYLE MAPPING: ITS PLACE IN INSTRUCTIONAL DEVELOPMENT

By
Ronald K. Bass and James D. Hand

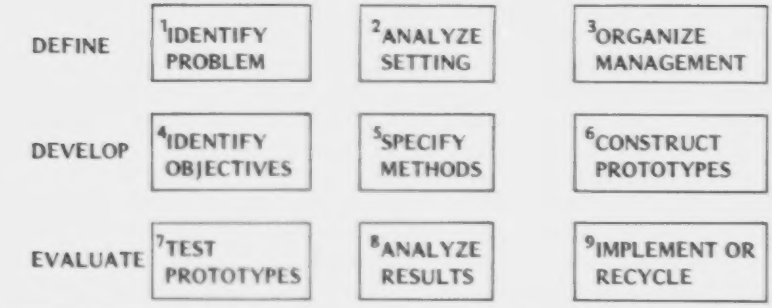
One of the primary reasons for the steadily growing support for instructional development, both in America and the rest of the world, is the common sense approach taken by its advocates toward educational problems (both anticipated and real). The idea that one cannot fully understand a problem until one understands all its component parts, and their interactive factors, is integral to I.D.

Numerous models for and approaches to instructional development have been developed by individual educators and educational institutions. The military relies heavily upon I.D. techniques (Air Force – *Handbook for Designers of Instructional Systems*, Navy – *Job Training Course Design and Improvement*, Army – *Systems Engineering of Training)*. Many commercial agencies have undertaken the development and marketing of packages designed to train educators in the concepts of instructional development ("Systems Approach for Education," Corregain Associates; "Criterion Referenced Instruction," Mager Associates; "Designing Effective Instruction," General Programmed Teaching; "Learning Systems Design," McGraw Hill; and others).

The approaches advocated and the models developed by these individuals and by educational, military, and commercial agencies vary in structural development, ranging from the four-step model developed by DeCecco (1968) to the 60-step "maxi" model developed by Abedor (1971) and therefore have obvious differences in complexity and specificity. There is, however, consistency in the inclusion of the basic areas: define or analyze, develop or design, and evaluate. Thus, even though the models are different, the basic approach is the same.

For purposes of this analysis, only one model will be utilized, the model developed under the auspices of the National Special Media Institutes (NSMI), a consortium of Syracuse University, The University of Southern California, Teaching Research of Oregon, and Michigan State University. The model covers the three basic areas common to most models – define, develop and evaluate – and the areas are further broken down to form a nine-step instructional development model (Figure 1).

Figure 1. NSMI Instructional Development Model.



The above model and other models have been used relatively effectively to solve instructional problems. However, there are several areas (steps) of the model in which more information than is normally gathered is needed if optimum decisions are to be made (steps 2, 5, 6, 8 and 9 — the steps where individual differences are most important).

One of the least understood and most complex components of any educational system is its students. It is not enough to know the age, sex, socio-economic background, family life and I.Q. of students. While this information is valuable, research data derived from studies employing these factors correlated very poorly with student success in using different forms of instruction. The employment of psychological factors (such as field dependence/independence, concrete/abstract thinking, dominance, assertiveness, nurturance, perseverance, romanticism, and idealism) has also provided precious little useful information concerning the interaction of a learner with instruction of a particular form in a particular instructional setting.

The general failure of educational research to provide meaningful data concerning the interaction between the learner and the instruction and between the learner and the instructional setting is attributable, in large part, to the practice of researching one characteristic of the learner at a time.

Picture this situation, not uncommon at all in the literature. One hundred students are tested for field dependence/independence. Fifty are found to be field-dependent (D) and fifty are found to be field-independent (I). The researcher wishes to explain learner achievement in interaction with a videotaped lecture (VT) and learner achievement in interaction with a printed copy of the lecture (PR), in terms of learner's degree of field dependence/independence. A 2 x 2 factorial is established thusly:

	D	I
VT	N=25	N=25
PR	N=25	N=25

Even if the learners are matched to account for pre-test scores, I.Q., or some other factor; even if the lecture is analyzed to determine whether the information is presented inductively or deductively; there yet remain factors interacting within the system which have not been accounted for.

The intent of this type of research is to study discrete variables in as "clean" a way as possible. The problem inherent in this approach is that learners, instructors, and instructional settings are *not* discrete variables. Until very recently it was impossible to investigate interactions of the learner *as a whole* with instruction. With the development by Joseph E. Hill of Oakland Community College in Bloomfield Hills, Michigan of a framework known as the Educational Sciences and of a construct known as educational cognitive style mapping, the possibility for this type of research has become manifest and the construct is being used extensively in many locations across the country as the basis for individualization or personalization of instruction.

Educational cognitive style provides a profile of the individual student's strengths and weaknesses which might affect his education, a profile showing how he comes to know. This increase in valuable information, as to the individual differences of students, affords a much better opportunity for the appropriate design of instruction.

The goal of the Educational Sciences, then, is to provide information concerning the interactions between the student and the instruction and between the student and the setting in which the student learns. There has now been twenty years of research using educational cognitive style; this research has yielded much information concerning the prescription of educational treatments for students.

EDUCATIONAL COGNITIVE STYLE

The theoretical construct of educational cognitive style is composed of the following four sciences:

1. Symbols and their meanings (29 elements)
2. Cultural Determinants (3 elements)
3. Modalities of Inference (5 elements)
4. Electrophysiological and Biochemical Aspects of Memory Function

For practical purposes, however, only three of these sciences are currently being utilized in the design of instruction.

SYMBOLS AND THEIR MEANINGS is an area in which students are assessed as to their abilities to utilize both the theoretical and qualitative symbols. Theoretical symbols are those having to do with written or spoken words or numbers and qualitative symbols are those having to do with the senses and feelings, commitments, and values.

The elements assessed under symbols and their meanings are: (Hill, 1971) (Hill, 1975).

THEORETICAL SYMBOLS

1. T(AL): Theoretical Auditory Linguistic – the ability to gain information from the spoken word.
2. T(VL): Theoretical Visual Linguistic – the ability to gain information from the written word.
3. T(AQ): Theoretical Auditory Quantitative – the ability to gain information from the spoken number.
4. T(VQ): Theoretical Visual Quantitative – the ability to gain information from the written numeral.

QUALITATIVE SYMBOLS

There are twenty-five (25) qualitative symbols. Five of them are associated with sensory stimuli.

1. Q(A): auditory – the ability to perceive meaning through the sense of hearing.
2. Q(O): olfactory – the ability to perceive meaning through the sense of smell.
3. Q(S): savory – the ability to perceive meaning by the sense of taste.
4. Q(T): tactile – the ability to perceive meaning by the sense of touch.
5. Q(V): visual – the ability to perceive meaning by the sense of sight.

Ten of the qualitative symbols are programmatic in nature, and as such, can be thought of as "sixth senses."

1. Q(PF): Qualitative Proprioceptive (Fine) – ability to synthesize a number of symbolic mediations into a performance demanding monitoring of a complex task involving small, or fine, musculature (e.g., playing a musical instrument, typewriting); or into an immediate awareness of a possible set of interrelationships

between symbolic mediations, i.e., dealing with "signs." While qualitative proprioceptive fine symbolic intelligence is most readily observable in seemingly automatic motor responses such as reading and playing music, certain types of theoretical symbolic mediation also require qualitative proprioceptive activity. For example, the synthesis of a number of symbolic mediations is evident when an individual upon seeing a sign of smoke immediately interprets it as evidence of fire and experiences an interplay of many sensations including smell of smoke, taste of smoke, and sensation of heat. In this instance, a network of previous experiences and related associations produces the theoretical mediation of fire along with the other qualitative aspects.

2. Q(PG): Qualitative Proprioceptive (Gross) – ability to synthesize a number of symbolic mediations into a performance demanding monitoring of a complex task involving large, or gross, musculature (e.g., throwing a baseball, skiing).

3. Q(PDF): Qualitative Proprioceptive Dextral (Fine) – a predominance of right-eyed, right-handed and right-footed tendencies (a typically right-handed person) while synthesizing a number of symbolic mediations into a performance demanding monitoring of a complex task involving small, or fine, musculature (e.g., writing right-handed).

4. Q(PDG): Qualitative Proprioceptive Dextral (Gross) – a predominance of right-eyed, right-handed and right-footed tendencies (a typically right-handed person) while synthesizing a number of symbolic mediations into a performance demanding monitoring of a complex task involving large, or gross, musculature (e.g., throwing a baseball with the right hand).

5. Q(PKF): Qualitative Proprioceptive Kinematics (Fine) – ability to synthesize a number of symbolic mediations into a performance demanding the use of fine musculature while monitoring a complex physical activity involving motion.

6. Q(PKG): Qualitative Proprioceptive Kinematics (Gross) – ability to synthesize a number of symbolic mediations into a performance demanding the use of gross musculature while monitoring a complex physical activity involving motion.

7. Q(PSF): Qualitative Proprioceptive Sinistral (Fine) – a predominance of left-eyed, left-handed and left-footed tendencies (a typically left-handed person) while synthesizing a number of symbolic mediations into a performance demanding monitoring of a complex task involving small, or fine, musculature (e.g., writing left-handed).
8. Q(PSG): Qualitative Proprioceptive Sinstral (Gross) – a predominance of left-eyed, left-handed and left-footed tendencies (a typically left-handed person) while synthesizing a number of symbolic mediations into a performance demanding monitoring of a complex task involving large, or gross, musculature (e.g., throwing a baseball with the left hand).
9. Q(PTF): Qualitative Proprioceptive Temporal (Fine) – Ability to synthesize a number of symbolic mediations into a performance demanding the use of fine musculature while monitoring a complex physical activity involving timing.
10. Q(PTG): Qualitative Proprioceptive Temporal (Gross) – ability to synthesize a number of symbolic mediations into a performance demanding the use of gross musculature while monitoring a complex physical activity involving timing.

The remaining ten qualitative symbols associated with cultural codes are defined as:

1. Q(CEM): Qualitative Code Empathetic – sensitivity to the feelings of others; ability to put yourself in another person's place and see things from his point of view.
2. Q(CES): Qualitative Code Esthetic – ability to enjoy the beauty of an object or an idea. Beauty in his surroundings or a well-turned phrase are appreciated by a person possessing a major strength in this area.
3. Q(CET): Qualitative Code Ethic – commitment to a set of values, a group of principles, obligations and/or duties. This commitment need not imply morality. Both a priest and a criminal may be strongly committed to a set of values although the "values" may be decidedly different.

4. Q(CH): Qualitative Code Histronic – ability to exhibit a deliberate behavior, or play a role in order to produce some particular effect on other persons. This type of person knows how to fulfill role expectations.
5. Q(CK): Qualitative Code Kinesics – ability to understand, and to communicate by non-linguistic functions such as facial expressions and motions of the body (e.g., smiles and gestures).
6. Q(CKH): Qualitative Code Kinesthetic – ability to perform motor skills or to affect muscular coordination according to a recommended or acceptable form (e.g., bowling according to form, or golfing).
7. Q(CP): Qualitative Code Proxemics – ability to judge the physical and social distance that the other person would permit to exist between oneself and that other person.
8. Q(CS): Qualitative Code Synnoetics – personal knowledge of oneself.
9. Q(CT): Qualitative Code Transactional – ability to maintain a positive communicative interaction which significantly influences the goals of the persons involved in that interaction (e.g., salesmanship).
10. Q(CTM): Qualitative Code Temporal – ability to respond or behave according to time expectations imposed on an activity by members in the role-set associated with that activity.

Theoretical symbols are used in ordinary language to communicate ideas in a connected, consecutive manner according to the principles of common logic. Qualitative symbols are used to convey feelings, commitments and values, and to provide particular types of insight into the domain of self.

CULTURAL DETERMINANTS is an area in which the preferences and predispositions of students toward ways of working and ways of making decisions are assessed. Do they prefer or are they predisposed to work or make decisions in conjunction with their associates (A), in conjunction with their families or authority figures (F), or independently (I)?

MODALITIES OF INFERENCE is an area in which students are assessed concerning how they prefer to process and integrate new information into their cognitive structure. Are they categorical thinkers who are aided greatly by definitions, rules, or step-by-step procedures (M)?

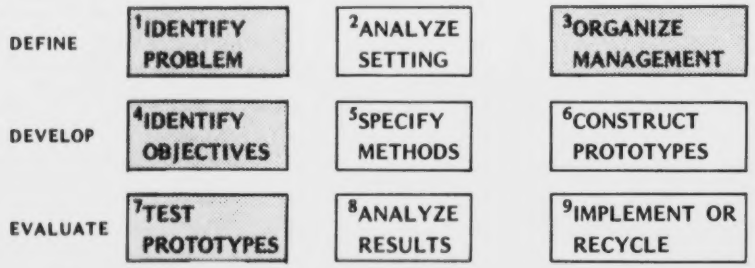
Are they most comfortable with sharp 1-to-1 contrasts, or information which tells them how new information differs from what they already know (D)? Are they most comfortable with data which relates new information to what they already know (multiple relationships) (R)? Or, are they most comfortable with a combination of these, gathering as much information as possible about a situation before a decision is made (L)?

NSMI INSTRUCTIONAL DEVELOPMENT MODEL AND COGNITIVE STYLES

Three sciences, then, based upon twenty years of research, provide information concerning how individuals come to know and, thus, how their instruction can be personalized.

This means that instructional developers not only can, but must, consider more information about each student, more individual differences in the design of instruction. This information is critical to five of the steps of the nine-step NSMI Instructional Development Model (Figure 2).

Figure 2. NSMI Instructional Development Model.



Now when an instructional developer analyzes the setting (Step 2) he must gather information about the individual differences which each student brings to the instructional situation. The methods of instruction that are selected (Step 5) must be chosen based upon the strengths and weaknesses of the students who must interact with them in order to acquire information. These strengths and weaknesses must constantly be considered as instructional materials are being constructed (Step 6). An analysis of results (Step 8) and recycling/revision/implementation decisions (Step 9) can be of value only if students' successes and failures can be related to the individual differences exhibited by these students (i.e., Cognitive Styles).

One of the main advantages of Educational Cognitive Style over other approaches to the description of individual differences is the prescriptive aspect of the approach.

Based upon research through the years, information has been gathered as to what cognitive style elements are required in a student for the student to be successful in interaction with a particular instructional situation. Some examples of general "modes of understanding of a task" (cognitive style elements required in a student for the student to be successful in interaction with a particular instructional situation) are as follows: (Hill, 1971)

INSTRUCTIONAL SITUATION A

Programmed Text

(T(VL))		(I)		(M R)
( )		( )		( )
(Q(CET))	x	(a)	x	(r m)
( )		( )		( )
(Q(CS))		( )		( )

T(VL) is the ability to gain information from the written word (very logically a part of work with a programmed text).

Q(CET) is commitment to a set of values or a group of principles (a commitment is required if a student is to successfully "work through" a programmed text).

Q(CS) is personal knowledge of oneself (needed for one to be successful in assessing his or her ability or time requirements in interacting with a programmed text).

I is an indicator of individuality (most programmed texts are utilized alone).

The (a) is an indicator of *minor* associate orientation (sometimes programmed texts are utilized with a fellow student).

M is an indicator of categorical thinking or step-by-step procedures (predictable, since a programmed text moves step-by-step).

The r is an indicator of relationships (steps in a programmed text often refer the student to previous steps – "as you recall from Step 23").

INSTRUCTIONAL SITUATION B

Seminar Designed to Enrich

(T(AL))		(F)		(R L)
( )	x	( )	x	( )
(Q(CEM))		( )		( )

T(AL) is the ability to gain information from the spoken word (logical in that a seminar has to do with spoken communication).

Q(CEM) is the ability to place oneself in the place of others and understand their feelings – empathy (it is important not to ignore the prevailing mood in a seminar).

F stands for family or an authority figure (since in a seminar designed to enrich the faculty member taking the leadership role thereby assumes the role of an authority figure).

R is an indicator of relationships (to enter into the discussion in a seminar, one must relate what one has to say with what has been said before).

L is an indicator of the ability to think about a situation in every possible mode or to understand any type thought process presented in a seminar (participants must be able to understand and respond to everything that is said by others).

INSTRUCTIONAL SITUATION C

Individualized Instruction

(T(AL))		(I)		(M R)
( )		( )		( )
(T(VL))		( )		( )
( )	x	( )	x	( )
(Q(CS))		( )		( )
( )		( )		( )
(Q(CET))		( )		( )

Perhaps you would like to think through this one on your own. Refer to the examples above and to the definitions on pages 5–9.

Now consider the following situation which illustrates the necessity for considering more than a single variable when individualizing instruction.

The map for the "Mode of Understanding" for the seminar designed to enrich was presented earlier and is as follows:

(T(AL))		(F)		(R L)
( )	x	( )	x	( )
(Q(CEM))		( )		( )

There's another type of seminar – one designed for producing a "rap" among students and instructors. In this situation, the instructor takes a collegial role. The map for this situation is as follows:

(	T(AL)	)		(	A	)		(R L)
(		)	x	(		)	x	( )
(	Q(CEM)	)		(		)		( )

The only difference in these two maps is in the second set; all of the elements are the same but one, yet the student who has no F in his map is very likely to be unsuccessful in a seminar designed to enrich and the student who has no A in his map is very likely to be unsuccessful in a Seminar for Rapping.

The setting is also quite important when one considers the abilities of a student to successfully interact with instruction. A student may have a very strong ability to gain information from the spoken word (T(AL)) but may be unsuccessful in gaining information from an audiotape in a learning carrel because he lacks the ability to work alone (I).

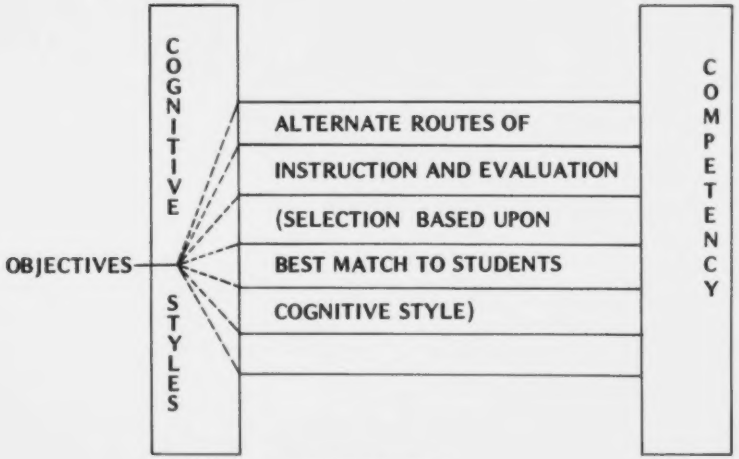
In short, we must always acquire as much information as possible about the student for whom we are designing instruction and must very carefully match instructor, instructional mode, and instructional setting to the student based upon the information we have about him (cognitive style).

No longer can the selection of instructional media be solely based upon the material to be taught. Now instructional developers must expand their planning to include answering the more precise question of which medium is most appropriate for teaching what to whom?

Instructional developers must move toward an approach similar to the one illustrated in Figure 3. In this model, the alternative routes of instruction and evaluation are defined in terms of the cognitive style elements required for a student to successfully interact with the instructional situation. Each student is guided into the alternate route which most closely matches his cognitive style.

Of the ways currently available for assessing individual differences and utilizing the information in the design of instruction, Educational Cognitive Style appears to be of greatest value. This value defines its place in instructional development.

FIGURE 3. COGNITIVE STYLE ID MODEL



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CHAPTER VII

THE ORGANIZATION AND IMPLEMENTATION OF INSTRUCTIONAL DEVELOPMENT PROGRAMS IN HIGHER EDUCATION:

A REVIEW OF LITERATURE

By

Joseph J. Durzo

Introduction

The focus of this literature review is on the organization and implementation of instructional development programs in higher education. The literature reviewed here is concerned primarily with the organization and implementation of instructional development programs rather than with the specific instructional design procedures or models used by various agencies. [1] No attempt will be made here to review the theories, research evidence, and procedures used in the design and evaluation of instructional products, which range in scope from units of instruction to entire courses or groups of courses. General reviews and discussions of these topics may be found in sources such as Baker (1973), Baker and Schutz (1971), and Gerlach and Ely (1971).

The following topics are included in the review: (1) The Nature of Instructional Development, (2) The Instructional Development Movement, (3) The Role of Instructional Development Agencies, (4) Characteristics of Instructional Development Agencies, (5) Approaches to Instructional Development, (6) The Scope of Instructional Development Projects, (7) Project Generation and Selection, and (8) Implications for Implementing Instructional Development Programs.

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[1] For information about the nature of particular instructional development agencies see L. T. Alexander and S. L. Yelon (eds.), *Instructional development agencies in higher education.* East Lansing, Michigan: Michigan State University, Learning Service, 1972.

The Nature of Instructional Development

Instructional development is a relatively new movement in education. As with any relatively new field of endeavor, there is still much discussion about the definitions and terminology used by those practicing instructional development. Many writers have provided descriptions and definitions of instructional development. Some definitions, such as the one by Engel (1969) are rather technical in nature and seem to those outside the field of educational technology to be overly reliant on the jargon of education:

> **Instructional Development:** A program whereby specialists, working with faculty at the message, unit, or course level, analyze the learner; specify objectives; scrutinize content and establish teaching strategies; procure and produce appropriate media; field test; evaluate, revise, and implement the instructional patterns thus developed. (pp. 18–19)

Another definition of instructional development was offered by Clarence Schauer (1971), the Vice-President for Academic Affairs at William Rainey Harper College. He described a college administrator's view of instructional development:

> The term Instructional Development is a new one, and it has different meanings for different people. I will define Instructional Development as *common-sense planning of cooperation to identify and define learning problems and to attempt resolution of these problems with a plan for action, evaluation, tryout, feedback, and results.* (1971, p. 44)

Gustafson (1971), a practitioner in the field of instructional development, offered a simple definition. He said that instructional development is "a process for improving the quality of instruction" (p. 1). Hamreus, another instructional development professional, described instructional development as "a systematic process of bringing relevant goals into effective learning activity" (p. 1). Buhl (1975) suggested that instructional development can be thought of as "a set of activities aimed at improving the conditions of learning for students" (p. 2). A common theme underlying these and other definitions is the application of some sort of systematic process to the design or development of instruction. The Definition and Terminology Committee of the Association for Educational Communications and Technology (1972) described this common theme as "systems design" or the "systems approach to instructional development." The Committee explained further:

> The purpose of systems thinking and procedures . . . is to provide a way of being systematic about how we develop, organize and make available learning resources for the learner. (p. 38)

Twelker, Urbach, and Buck (1972) described the origins of the systematic approach in education:

> The systems approach in education traces its roots back to the development of weapons systems in the military and, more recently, the production of commodities in industry. . . . The systems approach is in a very real sense a management tool that allows individuals to examine all aspects of a problem, to inter-relate the effects of one set of decisions on another, and to optimally use the resources at hand to solve the problem. (p. 1)

They described the "systems approach to instruction" as a "systematic way of identifying, developing and evaluating a set of materials and strategies aimed at accomplishing a particular goal." (p. 1)

Despite the many different points of view on various issues held by authors writing about instructional development, there is general agreement that instructional development implies some sort of systematic approach to the design or improvement of instruction. Jerry Gaff (1975 b) offered a definition intended to clarify the meaning of the term for faculty and administrators who are not familiar with many of the sources cited earlier in this section:

> Instructional development is a recent academic specialization that may be defined as the systematic and continuous application of learning principles and educational technology to develop the most effective and efficient learning experiences for students. (p. 47)

In general, when the term "instructional development" is used in this chapter it will be in the broad sense of the Gaff definition.

The Instructional Development Movement

The Carnegie Commission on Higher Education (1972) described an emerging group of professionals whose job it is to "help faculty members define objectives of courses of instruction, to plot the learning strategies to be employed, and to evaluate the results" (p. 71). These professionals are generally referred to as instructional developers or instructional development specialists. The Commission recommended that:

> Colleges and universities should supplement their instructional staffs with qualified technologists and specialists to assist instructors in the design, planning, and evaluation of teaching-learning units. . . . (pp. 73–74)

Holsclaw (1974), Twelker, *et al.* (1972), and others have observed that the movement toward systematic instructional development in education is rapidly gaining attention and acceptance in this country. Diamond (1971) concluded that:

> There can be little doubt that, as far as the media profession is concerned, instructional development is "in." The symptoms are everywhere – new job titles with new descriptions, new terminology, new organization charts, new graduate curricula designed to meet the growing demand for experts in the area, and, of course, convention programs built around the topic. (p. 6)

Buhl (1975) emphasized the relative recency of the instructional development movement, explaining that as a formal movement "with a set of people who see themselves working at a profession, instructional development is perhaps no more than 15 years of age. Only over the last five has it gathered real force" (p. 3). Gaff (1975 a) also discussed the recent growth of instructional improvement programs in higher education:

> Centers, divisions, offices and programs have been established to provide services variously referred to as instructional development, learning resources, faculty development, teaching improvement, professional development, or organizational development. They have been established by every kind of college and university as well as by state systems, consortia, and associations. . . .
>
> These new enterprises are still in the formative stage. Improving the quality of instruction has been like the weather – everybody talks about it but nobody does anything about it. But today, new concepts of instructional improvement are being advanced and new programs are providing opportunities for faculty members to enhance one or more aspects of their teaching. (p. 91)

Vogel (1973), Butterbaugh (1971), Engel (1969), and Alexander and Yelon (1972) have also pointed out the increasing numbers of colleges and universities which have recently developed agencies or programs on their campuses to support the improvement of instruction. Semas (1975) in the *Chronicle of Higher Education* recently discussed the "explosive growth" of programs in higher education intended to improve the quality of teaching.

Gaff (1975 b) concluded that the specialization of instructional development came into being as the result of four different forces: (1) the recent impact of results of years of research on the learning process; (2) the application of the systems approach to the production of learning materials and educational design; (3) the development of a set of procedures for the improvement of teaching, commonly referred to as the instructional development process; and (4) adoption by educational technologists of the instructional development approach as an outgrowth of their earlier involvement in the design and production of instructional

materials. Alexander and Yelon (1972) attributed the development of such programs and agencies to the increasingly widespread dissatisfaction with the quality of undergraduate education. Schauer (1971) argued that the students attending colleges and universities and the fiscal supporters of those institutions have begun to place increasing pressure on the institutions to produce improved results from instructional programs. He asserted that necessary instructional innovation and improvement are not easy tasks:

> It has become evident in the past few years that the improvement of instruction necessitates a concerted effort on the part of able teachers, administrators, resource people, and concerned citizens. (p. 44)

Wight (1973) concluded that higher education will have to face four major problems in the next decade which will necessitate changes in the conception of instruction and the structure of higher education:

1. A larger and more diverse population must be served.
2. Costs must be reduced while satisfying increased demand.
3. Education must conform to the schedules of a non-traditional working student population.
4. Education must meet the needs of a technological society which changes constantly. (p. 44)

Gaff (1975 a) explained that higher education will have to look inward to solve these problems, since the end of the era of surplus external money and high faculty mobility has limited the likelihood of change coming from infusions of external money or new faculty members:

> Most colleges and universities are affirming the primacy of teaching rather than research. Faced with the prospects of leveling student enrollments, declining faculty positions, and becoming "tenured in," most institutions are coming to realize that they will have to rely on their current faculty to provide fresh perspectives, infuse new ideas, and give leadership to innovative programs if they expect to maintain vigorous educational climates in the years ahead. (p. 91)

In order to assist their faculty members to meet these challenges, many institutions have turned to instructional development, fueling the growth of such programs.

Popham (1974) concluded, however, that the quality and sophistication of such programs in higher education "lags by several decades the quality and sophistication of R & D to improve elementary and secondary instruction" (p. 11). He went on to paint a dismal picture of the work to be done in improving collegiate instruction, setting forth reasons similar to those presented by other critics of collegiate instruction:

> It is not difficult to account for the low quality of university teaching. The vast majority of university professors have given little, if any, formal attention to the conduct of instruction. Most professors acquire their instructional styles largely as a consequence of emulating a respected professor, or through some sort of ill-defined borrowing from the dozens of diverse teachers they (as students) have encountered. Few professors have devoted any systematic consideration to the procedures whereby instruction can be planned so that it is optimally effective. Few have really considered the most appropriate instructional activities for their classes, preferring instead to "cover" as much content as possible. Still fewer have attempted to familiarize themselves with methods of determining their instructional effectiveness on any grounds other than their own intuitive impressions, occasionally abetted by student ratings. (p. 11)

He argued that colleges and universities must substantially strengthen their commitments to teaching improvement in order to make inroads in what he viewed as a serious problem. He further claimed that many of the efforts now underway on the nation's campuses are "tokenistic and half-hearted," operating on insufficient budgets and run by administrative "hacks."

> In numerous institutions of higher learning the commitment to improve faculty instructional capabilities is largely political, stemming more from public relations motives than from a genuine desire to bring about increased faculty effectiveness. To get a true fix on a university's devotion to staff improvement, check first the size of the financial allocation for that enterprise, then judge the quality of the personnel assigned to the task. (p. 13)

Instructional development is a young movement. Popham wondered about its future, asking whether instructional improvement will become "an integral part of any effectively functioning institution of advanced learning? Or will 'instructional development programs' in higher education disappear as a fad . . . ?" (p. 13) In part, the answer to that question may lie in the ability of those planning instructional development programs to learn from the efforts of programs which are already in existence.

The Role of Instructional Development Agencies

An increasing number of colleges and universities have established agencies on their campuses intended to provide support for faculty who desire to attempt academic innovation. While the scope and structure of these agencies vary from campus to campus, they share one common goal: to contribute to the development of improved college instruction.

Despite their different titles, such agencies were referred to by Alexander and Yelon (1972) as "instructional development agencies" because of their common mission to improve college instruction.

According to Diamond (1974), the role of instructional development agencies is to function as catalysts in bringing about change in academic programs. He argued that instructional development agencies are necessary to stimulate change because schools and departments alone "do not have the resources, the clout, or the range of expertise required to implement major program changes" (p. 8). He explained that a central agency located in a relatively high position in an institution can provide development and evaluation assistance and funds for the faculty release time necessary to do instructional development. The agency can also act as an institutional communications network, while functioning as an advocate for instructional innovation. Briley (1971) commented that instructional developers and instructional development agencies are necessary to "provide instructional leadership, assuring that the college is accountable for the learning – or lack of learning – which takes place among its students" (p. 40). He also said that such agencies serve as catalysts for the improvement of instruction providing specialists in the techniques and resources needed to improve instruction. Holsclaw (1974), Detweiler (1973), Grimes and Doyle (1971), Butterbaugh (1970), and other authors also stated that a major purpose of an instructional development agency is to function as a catalyst and support agency for instructional change. Schauer (1971) argued that such agencies are required in order to provide the necessary assistance to produce meaningful, long-range changes in educational programs. He pointed out that faculty and administrators often do not have the available time and energy necessary to produce broad changes:

> Traditionally, a teacher spends much time making instructional decisions while the student is in the classroom, but too often slights the preparatory and follow-up activities. Administrators are too often concerned about budgetary, landscaping and personnel problems, and check only on student enrollments, grade reports, student placement, and follow-up studies to monitor the activities of the educational process. (p. 44)

Roueche and Boggs (1970) listed seven functions which an educational development officer (an instructional developer-change agent) ought to perform in a community college setting:

1. To train faculty
2. To help select and state learning objectives
3. To help with measurement problems
4. To help design learning activities
5. To help redesign learning activities
6. To conduct instructional research and evaluation
7. To promote research-based decisions (pp. 8–9)

In 1971, a conference attended by representatives of instructional development agencies of fourteen colleges and universities was held at Michigan State University. Alexander and Yelon (1972) summarized the various activities of these agencies and concluded that they could be placed into three major groups: service, research, and teaching. Their analysis of the activities of the instructional development agencies attending the conference is shown in Table 1.

The range of activities or roles outlined by Alexander and Yelon confirms Butterbaugh's (1971) statement that "Instructional design programs presently run the gamut of every nature and extent imaginable." (p. 26). The literature describes many of the roles undertaken by various agencies; however, it does not offer any clear answer to questions about the optimum combination of roles which an instructional development agency should play.

TABLE 1

TYPICAL ACTIVITIES OF FOURTEEN
INSTRUCTIONAL DEVELOPMENT AGENCIES

A. SERVICE

1. Conduct faculty workshops, seminars, institutes, and training programs on learning, instruction, and associated topics. (8)
2. Assist departments in analysis, planning, and design of curricula. (7)
3. Assist faculty to develop instructional materials. (7)
4. Internal publications: handbooks, project reports, and notes on instructional development topics. (7)
5. Consult with individual faculty members. (5)
6. Provide test scoring and analysis services. (5)
7. Provide instructional TV services. (5)
8. Administer and score standard tests (admission, placement, etc.). (5)
9. Provide media equipment (store, repair, and distribute). (4)
10. Maintain reference library on instructional development topics in higher education. (4)
11. Advise and assist community agencies outside university (schools, colleges, hospitals, UNESCO, and WHO). (4)
12. Maintain laboratories for faculty research and development in instruction. (3)
13. Provide administration with technical advisory services, re: instructional development. (3)

B. RESEARCH AND DEVELOPMENT

1. Learning system design: instructional models, materials and procedures. (14)

TABLE 1 (Cont'd)

2. Instructional programs: underprivileged students, honor students, foreign language students, simulation and gaming, and professional curricula (medicine, law, and pharmacy). (14)
3. Instructional evaluation. (8)
4. Training programs for faculty and teaching assistants. (5)
5. Individualized instruction, independent learning, computer-aided instruction, and programmed instruction. (5)
6. Educational tests and measurements. (4)
7. Impact of college on student development; recruitment. (3)
8. Organizational planning and governance. (2)
9. Cost benefit analysis of instructional systems. (1)
10. Instructional applications of media. (1)

C. COURSES TAUGHT

1. Instructional design and technology. (8)
2. Educational Psychology. (6)
3. Statistics and research design. (3)
4. AV Media. (3)

SOURCE: L. T. Alexander, S. L. Yelon (eds.). *Instructional development agencies in higher education.* East Lansing, Michigan: Michigan State University, Learning Services, 1972, pp. 4–5.

NOTE: Numbers in parentheses refer to the number of agencies reporting the activity.

Characteristics of Instructional Development Agencies

Lee (1972) reported on the results of a survey of 124 persons associated with instructional development programs about various characteristics of those programs. From the results he developed a profile of the "typical program." The following excerpts are from the profile of Lee's "typical program":

- The major objective of the program is to improve the quality of instruction at the parent institution.
- The program is still maturing since it has probably been in existence less than three years.
- Faculty size is approximately 550, and the size of the student body is around 15,000. (This is not to suggest that smaller or larger institutions have a greater or lesser potential for success in their development activities, but that the majority of today's practitioners are from the ranks of the "medium-sized" institutions.)

- The level of the program is uncertain. There is some concern that development not "outrank" the faculty, it being better for them to participate voluntarily than to do so of necessity.
- An advisory board exists to help the director guide the the development program.
- The director has firm control over faculty members who participate in the program.
- The program is well known among faculty members of the parent institutions as a result of publicity originating from the program itself. The program has received some notice from outside the institution as a result of its product marketing activities, which are also promoted by program personnel.
- The director's time is spent developing, consulting, teaching, researching, and administering in approximately equal amounts.
- The program is permanently housed in a central geographic location.
- Major program obstacles to more effective instructional development are lack of sufficient funds and lack of qualified personnel. Lack of faculty interest and inadequate physical facilities also impair the efficient functioning of the program, but to a lesser extent.

(pp. 16–17)

In an extensive review of instructional development, Detweiler (1973) observed that "The particular services offered and the internal structure of the programs vary greatly" (p. 29). She explained further:

> Central to all, however, is instructional design, the use of the systems approach to plan a course or curriculum. The scope of instructional design services varies. The service can mean, for example, giving faculty grants to write programmed learning booklets, or it can mean providing a Plato computer terminal and staff to assist faculty in creating software for it. It can mean complete film production services, or it can mean courses for the faculty on computer assisted instruction. (p. 29)

The kinds of services provided and, hence, the characteristics and structures of the agencies, depend largely upon the approaches taken by the agencies to improve instruction. (The major approaches taken by instructional development agencies are discussed in a subsequent section of this chapter.) Detweiler (1973) pointed out that the literature does not effectively prescribe the appropriate structure and functions for a given instructional development agency at a given institution:

> The exact nature of the individual programs depends partly on the institution's financial capacity and partly on the extent of services offered elsewhere on campus. . . . Thus, every Instructional Development program must be custom-made for its own campus circumstances, and that is part of the difficulty in finding a model. (p. 29)

Diamond, *et al.* (1975), however, suggested that three basic components should be a part of any instructional development agency: development, evaluation, and production.

Despite the differing views in the literature about the purposes of instructional development agencies and the components that they should have, the following three characteristics appear to be of central importance to all agencies: (1) administrative location, (2) funding, and (3) staff.

ADMINISTRATIVE LOCATION

Alexander and Yelon (1972) believed that instructional development agencies can have the most influence on instruction if they are located within the administration of an institution at a point where they can have a high impact on a large number of faculty members. They were not surprised to find "that of the fourteen agencies represented at the (Michigan State University) conference for which data are available, nine are located in the central administration of their university" (p. 5). They also reported that the directors of these agencies were directly responsible to the highest academic officer, the provost, the vice-president for academic affairs, or the chancellor. Butterbaugh (1970) noted that all six of the instructional development agencies that he studied were structured and organized directly under the University chief academic officer. Engle (1969) reported that in a survey of 72 instructional development programs, "institutional presidents, vice-presidents and deans account for 68 per cent of the responses specifying who sets administrative policy for instructional development" (p. 67).

FUNDING.

Alexander and Yelon (1972) reported a wide variation in the annual budgets of the instructional development agencies attending the Michigan State Conference. As expected, they noted that the budget size was directly related to the size of the staff and consequently to the number and variety of activities of the programs. Their summary of the relationship between budget size and staff is presented in Table 2.

TABLE 2

ANNUAL BUDGETS (1970–1971) AND STAFFS OF FOURTEEN INSTRUCTIONAL DEVELOPMENT AGENCIES

Budget (thousands of dollars)	Agencies	Professional Staff (FTE) Range	Median	Total Staff Range	Median
less than 200	5	1–6	3	2–17	6
200–399	3	2–27	6	5–30	27
400–599	2	7–9	–	38–45	–
600 or more	2	10–65	–	94–95	–
No data	2				

SOURCE: L. T. Alexander and S. L. Yelon (eds). *Instructional development agencies in higher education.* East Lansing, Michigan: Michigan State University, Learning Service, 1972, p. 6.

NOTE: Five agencies disbursed additional funds as grants to faculty engaged in instructional development projects. These funds are not included in the table.

Diamond, *et al.* (1975) also observed that the total budget for an instructional development program will vary considerably from institution to institution. They developed a *sample* three-level budget for a university instructional development program (see Table 3). Level I is one possible approach to a start-up budget, while Levels II and III represent expanded budgets for larger operations.

In addition to the size of the budgets of the agencies, the sources of their support are also of interest. Alexander and Yelon summarized the sources of funds which supported 14 of the instructional development agencies represented at the 1971 Michigan State conference (see Table 4).

Engel (1969, p. 70) reported that the sources of funds for the 72 instructional development agencies that he surveyed were from varied sources including:

- A special fund from the central administration
- A grant or contract from an outside source
- Instructional development program/department or audiovisual center funds

(For continuation, see p. 124.)

TABLE 3

SAMPLE BUDGET FOR INSTRUCTIONAL DEVELOPMENT AT THREE LEVELS OF SUPPORT

	LEVEL I (Minimum start up)	LEVEL II	LEVEL III
Staff			
Director		$20,000	$25,000
Developer(s)	$18,000	16,000	48,000
Evaluator(s)	16,000	16,000	24,500
Clerical/Administrative	5,000	12,500	22,000
Graphic Artist	–	8,000	14,000
Graduate Assistants (Development/Evaluation) (includes tuition)		18,000	36,000
Part-Time Help	3,000	4,000	5,000
Faculty Employment/ Release time	8,000	12,000	15,000
Materials Editor	–	5,000	9,000
Operating (Project support)			
Office Supplies/Telephones	2,500	3,000	4,000
Travel	800	1,200	3,000
Instructional Materials (commercial)	1,500	3,000	6,000
Graphic/Photo Supplies	1,500	3,000	5,000
Equipment (Experimental and office)	2,000	3,000	5,000
Printing (will change if internal unit established)	1,000	3,000	5,000
	$59,300	$127,700	$226,500
Independent Learning Lab (see Appendix B)*			
Equipment and Furniture (one time only)	$20,000		
Staff (including Student Assistant)	8,000–14,000		
Instructional Materials	4,000 (first year)	$3,000 (second)	
Printing Operation			
Equipment	3,500		
Staff	8,000		
Supplies	4,000		

SOURCE: R. M. Diamond, *et al. Instructional development for individualized learning in higher education.* Englewood Cliffs, N. J.: Educational Technology Publications, 1975, p. 24.

NOTE: The budget does not cover technical support (television, audio) or audio-visual services, both of which already exist to some extent on most campuses.

*Appendix B in R. M. Diamond, *et al.*

(Continued from p. 122.)

- Funds appropriated to individual departments for developmental work
- Interinstitutional consortium (a small amount for one institution)
- Self-perpetuating revolving fund (indicating a system of charges for service and sales of products)

He observed that the heaviest concentration of funds supporting instructional development programs came from the instructional development department or audio-visual center in which the program was housed. Twenty programs reported that 50 per cent or more of their funds came from grants or contracts from outside sources.

TABLE 4

INSTRUCTIONAL DEVELOPMENT AGENCIES' SOURCES OF FUNDS

Source	Number
University General Fund	5
Grant	3
Combination of General Fund and Grant	3
State Budget Line Item	2
No Data	1

SOURCE: L. T. Alexander and S. L. Yelon (eds.). *Instructional development agencies in higher education.* East Lansing, Michigan: Michigan State University, Learning Services, 1972, p. 6.

STAFF

Alexander and Yelon (1972) explained that instructional development agencies are usually staffed by professional, technical, and clerical personnel and by students working as research assistants. In some instances, professional staff members have joint appointments in academic departments. Detweiler (1973) concluded in her review that the exact size of the program staff varies from institution to institution, depending on the scope of the program.

In 1969 Engel found that the 72 institutions that he surveyed reported a predominance of media specialists on the instructional development teams of the various agencies. (It must be remembered, however, that in 1969, the frequency of use of the term "instructional developer" was much lower than at the present time. Many of the professionals in instructional development today began their careers in the media

programs of their institutions; thus it would be expected that in 1969 people doing instructional development would often refer to themselves as "media specialists.") Learning theorists and testing and evaluation specialists were also reported as being members of instructional development teams, usually on a part-time basis. Many of the 72 programs examined by Engel were staffed with a full-time director and one or more part-time staff members.

Alexander and Yelon (1972) observed that instructional development agencies are staffed primarily by behavioral scientists since "instructional development is essentially an applied behavioral science" (p. 6). They said that the staffs consisted primarily of psychologists, but that members of other disciplines were also represented, such as education, communication arts and sciences, instructional media and technology, and philosophy. Butterbaugh (1970) found that the program directors of the six agencies that he studied had doctorates in the areas of administration, educational research, educational psychology, instructional communications, and educational measurement and evaluation.

Diamond *et al.* (1975) recommended three basic staff functions which they believed to be necessary in agencies established to facilitate innovations: development, evaluation, and production. Recognizing that not all institutions may be able to afford a large agency, they explained that it is possible for a school to begin with an administrator (who also functions as a developer), an evaluator, minimal production support, and a single clerical position. In a cautionary note, Anderson (1972) warned of the dangers of increasing specialization within the field of instructional development. He argued that the amount of money needed to support large instructional research and development teams will prevent all but a few institutions from having large instructional development agencies. He explained the implications of this financial pressure:

> What this means for instructional development is fairly clear. Colleges and universities, if they go the development route at all, will be forced to do so with one or, infrequently, two full-time developers. (p. 21)

Anderson predicted that, for the most part, colleges will hire only one instructional developer who must be a jack-of-all-trades, with skills in analysis, design, research, and evaluation.

Approaches to Instructional Development

Not all instructional improvement efforts approach the problem in the same manner. In fact, different agencies often view the same symptoms as relating to different problems. Following a study of instructional

improvement programs for the Exxon Education Foundation, Gaff (1975 a) observed:

> Although all instructional improvement programs are designed to raise the quality of teaching and learning, these programs vary considerably. Depending on what aspects of the teaching-learning process they emphasize, they may be categorized in one of three ways: as instructional development, faculty development, or organizational development. Each category draws on different intellectual traditions, makes different analyses about what ails teaching and learning, and prescribes different solutions. (p. 94)

His book describing the results of the Exxon Study (1975 b) explained the differences among the three approaches. Instructional development, he thought, focuses on "courses or curricula, and . . . seeks to improve the conditions and materials that promote student learning" (p. 10). He felt that the intellectual roots for this approach lay in curriculum and instruction, learning theory, educational media and technology, and systems theory. This view is generally in agreement with the views of the majority of those writing about instructional development.

He described the faculty development approach as one which "focuses on faculty members and seeks to promote their individual growth and development" (p. 8). He observed that such programs help faculty to explore their attitudes about teaching and learning and acquire more knowledge and skills related to the teaching-learning process. Gaff felt that "the intellectual underpinnings of faculty development are in clinical, developmental and social psychology, psychiatry, and the sociology of work and socialization" (pp. 8–10). The focus of this approach is on faculty members rather than the courses they teach.

Organizational development, he said, focuses on the institution as a whole or on some sub-unit such as a department or a division and "seeks to create a more effective environment within which teaching and learning can occur" (p. 10). This approach is based on organizational theory, organizational change, and group dynamics. The goal of organizational development is to develop administrative and interpersonal competencies among organization leaders and to develop policies that support teaching improvement. Table 5 summarizes the three approaches described by Gaff.

Gaff presented a useful way of distinguishing among the types of instructional improvement efforts; however, he did not attempt to evaluate the relative effectiveness of each approach in improving the teaching-learning process. He did, however, suggest that these approaches are complementary and should be combined in any comprehensive approach to the problem of instructional improvement. Diamond (1974), Buhl (1975), and others have commented on the need for a comprehensive

TABLE 5

ALTERNATIVE CONCEPTIONS OF INSTRUCTIONAL IMPROVEMENT

	FACULTY DEVELOPMENT	*INSTRUCTIONAL DEVELOPMENT*	*ORGANIZATIONAL DEVELOPMENT*
Focus:	Faculty members	Courses or curricula	Organization
Purpose:	Promote faculty growth; help faculty members acquire knowledge, skills, sensitivities, and techniques related to teaching and learning.	Improve student learning; prepare learning materials; redesign courses; make instruction systematic.	Create effective environment for teaching and learning; improve interpersonal relationships; enhance team functioning; create policies that support effective teaching and learning.
Intellectual base:	Clinical, developmental, and social psychology; psychiatry; socialization.	Education, instructional media and technology, learning theory, systems theory.	Organizational theory, organizational change; group processes.
Typical activities:	Seminars, workshops, teaching, evaluation.	Projects to produce new learning materials or redesign courses; workshops on writing objectives, evaluating students.	Workshops for group leaders or team members, action research with work groups, task forces to revise organizational policies.

SOURCE: J. G. Gaff, *Toward faculty renewal.* San Francisco: Jossey-Bass, 1975, p. 9.

approach to instructional improvement efforts without specifically referring to the types of categories used by Gaff.

Professionals working within the field of instructional development are beginning to broaden their perspective of the field by expanding upon the kind of definition of instructional development presented above by Gaff to include a concern for the development of faculty skills as well as the development of courses. Abedor and Gustafson (1971) described two emphases which may characterize the operation of instructional development agencies: (1) an emphasis on product development (meant in this sense to be equivalent to Gaff's use of the term "courses"), or (2) an emphasis on people development. According to Abedor and Gustafson, "product-oriented" agencies are primarily concerned with the end-products of the development process: instructional products ranging from sets of materials to entire courses. "People-oriented" development agencies are concerned more with the professional growth of faculty and their attitudes toward instructional development than with the end-products of the process. Abedor and Gustafson believed that these two different emphases influence the operation of the agency and are important criteria used for selecting instructional development projects.

They pointed out that any product, no matter how well designed and validated, has a relatively short useful life compared to the length of time that a faculty member will be at an institution. This is particularly true now that faculty mobility is decreasing. Consequently, they argued that, in the long run, a faculty member who is committed to instructional development and has developed his/her skills in the process is likely to make a greater contribution to the improvement of teaching and learning at an institution than will the development of any single course. Beilby (1974) perceived the problem in economic terms, reasoning that the task of applying instructional development effectively to the public school setting "is too vast to be accomplished by any army of instructional developers we could realistically expect to produce" (p. 13). He also pointed out that school systems could not afford to hire the required number of instructional developers. The same problem of scale and economics applies to higher education.

There are, however, drawbacks to the people development (or faculty development) approach. Holsclaw (1974) concluded that a development agency with a major focus on people development may not generate tangible results as quickly as agencies which focus primarily on course development. Abedor and Gustafson (1971) also pointed out the time problem, adding that "people development takes considerably more time, effort, and money while the impact is difficult to measure — or predict" (p. 22). Schauer (1971) commented that, in the past, efforts

by faculty to create innovation had not been as productive as he would have hoped and argued for some method of supporting their efforts. Diamond *et al.* (1975) observed that academic change is never easy. They emphasized that "It is often frustrating, sometimes traumatic, and, regardless of the investment, never guaranteed. It requires talented faculty, full administrative support, and purposeful direction" (p. 3).

In a study of instructional development programs, Holsclaw (1974) observed that the institutions he studied were divided on the question of whether to emphasize products or people:

> Four respondents stated that the major emphasis of their instructional development programs was related to product development, while four other respondents replied that the major emphasis of their program was geared toward process (the development of professors). The five remaining respondents stated that the major emphasis of their programs was equally divided between product and process. (p. 90)

The solution to the problem seems to be to incorporate both emphases in an instructional development program. Abedor and Gustafson (1971), Gustafson (1971), Hoban (1974), DeBloois and Alder (1973), and others have argued persuasively that instructional development agencies must strike an effective balance between product development and people development.

The Scope of Instructional Development Projects

The literature on instructional development describes a general agreement among professionals in the field of instructional development that a systematic approach should be used to produce solutions to educational problems. The disagreement among these professionals seems, however, to relate to the size or scope of the problems to be solved by instructional development. Some instructional developers concentrate on the development of small, discrete units of instruction, often referred to as "product development," and others concentrate on larger projects, such as the development of entire courses or whole curricula. The use of the term "product" in this section differs somewhat from its use in the previous section. In the previous section, it was used as one pole of a continuum, "product development . . . . people development," where the term "product" represented the development of some tangible outcome of unspecified size, as opposed to the development of a faculty member's skills in doing instructional development. In this section, the authors cited generally used the term "product development" to refer to the systematic process of designing and validating a segment of instruction, usually *smaller* than a whole course.

Hamreus (1971) identified three sizes of instructional development projects that he felt were usually developed:

> (1) *the package size,* which is self-contained and can be purchased and inserted in a course by a teacher either as a supplemental element or to replace some specific lesson segment;
>
> (2) *the component size,* which constitutes a major unit of study in a course and which must be designed to dovetail nicely with that which already exists; and
>
> (3) *the total system size,* which is usually a total course or even a curriculum and either replaces an existing one or creates a new one. (p. 10)

Eickmann (1975) suggested that one of the characteristics that differentiates among the various instructional development programs in the country is the scope of the projects undertaken. He listed five sizes of projects: (1) curriculum, (2) program, (3) course, (4) smaller than course, and (5) tiny.

In an important review of the field of instructional development, Eva Baker (1973) placed her emphasis on the technology of developing instructional materials, rather than on the development of entire courses and curricula or on developing faculty skills in instructional development. She traced the history of materials development efforts in education and offered a summary of the issues and problems related to that process. Other authors have also written extensively about the development of various types of instructional products (Baker and Schutz, 1971; Briggs, 1970).

Concerning this product development view of the field of instructional development, Grimes and Doyle (1971) commented that:

> There is also a sense of something missing when one tries to relate Instructional Development to the larger question of the process of providing positive change in education. . . . Instructional Development, as it is currently being discussed, is really much closer to the process of instructional design than to the broader concept of educational design [consequently] the proper context in which to consider development as a concept is within the overarching context of the change process in education. (p. 53)

Heinich (1971) warned that, if instructional developers concentrate on the design of small instructional products, they are not entering into the development process early enough. By entering late, he felt that developers would tend to accept assumptions and institutional constraints which would unnecessarily restrict the outcome of the development process.

Diamond (1971) made a strong plea for instructional development programs to concentrate on large-scale projects that will have major impact. This approach is often called the "major project" approach or the

"concentrated" approach. The opposite approach, called the "shotgun approach," is to engage in a larger number of less intensive, smaller-scale, short-term projects. Diamond argued against the use of the shotgun approach. He felt that the goal of instructional development must be to create fundamental changes, and that to do so projects must be selected appropriately:

> Supporting numerous, small projects may make a lot of friends and keep our staff busy, but our long range impact will be minimal. This route takes too long to produce meaningful results. We should select major projects and do them well. Smaller efforts must be, in effect, pilot case studies designed to form a base for complete course or curriculum design. (p. 7)

In a summary report of the instructional development program at William Rainey Harper College, Vogel (1973) also echoed the need to focus on relatively large projects. The report recommended that:

> If the improvement of instruction and learning is going to have any lasting effect beyond some successful instructional units, then the instructional development process must be extended to full course development. (p. 8)

Not all instructional developers agree that the "major project" approach is appropriate. Holsclaw (1974) interviewed a group of instructional developers, some of whom expressed the following reservations about large projects:

1. With a large project, you tie yourself up for a year and only satisfy one or two faculty members.
2. If you concentrate on one big course, you have a great impact within one department, but you end up having zero impact on other departments.
3. There are many political and financial obstacles in the way of the big projects. (p. 97)

As a result of his research, Holsclaw developed a set of heuristics concerning instructional development. (He defined a heuristic as "a rule of thumb learned by successive discovery in which one places strong confidence that it is true, that it will work, and that it can be used with assurance." p. 6.) The heuristics that he outlined reflect the different points of view among instructional developers regarding the appropriate scope of instructional development projects. The names following the heuristic refer to the person who is primarily responsible for suggesting it:

Differing Views on "Shotgunning":

4. *Attack the need.* The important issue should be "What is the need?" then "What are the resources that can be brought to bear upon the need?" Don't be concerned about whether it is "shotgunning" or not "shotgunning" (Dale Hamreus).

5. *Start small – prove your worth* (Jerrold Kemp).
6. *"Shotgunning" gives quick turn around on a small scale* (George Vogel).
7. *Use little projects to get big projects* (Thomas Cyrs).
8. *If you "shotgun" you'll never show.* You may train professors and get everybody doing their own thing, yet you still won't come up with effective instructional change (Sherwood Bridges).
9. *"Shotgunning" rarely solves major problems or effects institution-wide changes* (Robert Diamond).
10. *Work for long-range impact on the institution – stick with complete course development or complete course redesign* (Robert Diamond). (pp. 204–205).

There is no universally accepted size for instructional development projects within the field of instructional development. It seems to depend on the mission that each development agency sees for itself. Alexander and Yelon (1972) summarized the choices facing an instructional development agency:

> An instructional development agency can invest its resources – time, energy, and money – in a large number of small projects or in fewer, more comprehensive projects. The choice of project size should depend on its impact. A large number of relatively small instructional projects produces an impact on many departments. Fewer, larger projects produce large changes within the target departments. The main criterion is the estimated probability of success. Projects that produce no definite results, or that are not implemented, produce frustration and disillusionment. (p. 13)

Diamond *et al.* (1975) and Diamond (1971) have consistently argued that the goal of instructional development should be to have maximum impact on the instructional programs of an institution. To do this they suggest that development agencies should identify the top priorities of an institution and choose projects which reflect these priorities. The strategy they advise is to complete a few major projects which will have widespread impact rather than to support numerous small projects which have little overall impact on the nature of the academic program.

Project Generation and Selection

Diamond *et al.* (1975) identified two major methods of generating instructional development projects – the internal approach and the external approach. In the internal approach, the staff of the agency works directly with the administration, deans, and department chairmen to identify high priority needs and to recruit the appropriate faculty to

carry out the project. Little effort is made to sell the services of the agency to the faculty at large. Rather, the focus of this approach is to support those projects which will have maximum impact on the institution. They list the advantages and disadvantages of this approach:

Advantages

(1) Better balance between priorities and projects.
(2) Fewer rejected projects.

Disadvantages

(1) The overall effort will begin slowly.
(2) Requires extensive administrative cooperation at both the department and college level. (pp. 28–29)

In the external approach, a highly-publicized faculty grant program is initiated to encourage individual faculty members and departments to submit proposals for support by the agency. The scope of this support varies from agency to agency, depending on the context of the institution. The advantages and disadvantages of this approach were also presented:

Advantages

(1) Generates many project requests.
(2) An excellent method of advertising administrative commitment to instructional improvement.

Disadvantages

(1) Many projects will be low-priority and of questionable quality.
(2) Faculty who are turned down may be antagonized.
(3) Close control of projects may be lost unless specific operational guidelines are built into the funding process.
(4) Coordination of projects to meet specific institution-wide goals may be limited.
(5) Political considerations for institutional balance may force awarding of grants to some high-risk, low-priority projects. (p. 32)

Dietrich and Johnson (1967) advised that it is wise to develop a grant program within a university and suggested a simple approach:

> A project base gives the chance to select the activities which most need support. A simple proposal, review, approval, monitoring and reporting function would be established. Faculty members should spend only a minimum time on this procedure and devote a maximum effort to the project itself. (p. 212)

Alexander and Yelon (1972) offered a set of four criteria which have been used to assess such proposals: "(1) the number of students affected, (2) evidence of an experimental approach, (3) potential

application in other areas, and (4) the possibility of evaluation" (p. 9). They also added that the staff of the instructional development agency should stand ready to assist the faculty members in writing and carrying out the proposals. Diamond *et al.* (1975) went further and argued that, if quality is to be maintained with this approach, "then the control of every project must remain with the development unit rather than with the requesting department" (p. 32). They asserted that in cases where funds have been given directly to the departments without sufficient control, the results have been unsatisfactory. DeBloois and Alder (1973) described the approach used at Utah State University which they felt combined the best aspects of the external approach with the need for developer control. The program consists of three phases of activity: Phase 1 involves *awareness activities* designed to make faculty aware of the available services and to circulate information about the teaching-learning process. Phase 2, *faculty support activities*, provides small grant awards to faculty to support limited efforts to improve their instruction and provides gratis support from the instructional development staff. Phase 3, *instructional development activities*, provides both financial support and assistance from the instructional development program for faculty who wish to initiate a full-scale development effort. They felt that this model represented a low-profile approach which cultivated faculty support for instructional development activities and provided for control by the instructional development agency.

Implications for Implementing Instructional Development Programs

The final section of this chapter represents an attempt to derive implications from the literature with respect to the implementation and operation of an instructional development program. The purpose of this section is to present prevailing opinions about key issues which must be considered in the process of implementing an instructional development program.

ADMINISTRATIVE COMMITMENT

Major academic change requires serious administrative commitment in actions as well as words. Ideally, this commitment should include: (1) financial support for the program, preferably from "hard" institutional moneys rather than from short-term grants; (2) establishment of administrative procedures that facilitate change (a new credit system, flexible classroom scheduling, etc.); (3) access to various institutional resources which may be necessary in the development process (such as computers, media support, etc.). Without a firm commitment to instructional change, the fate of any program is sealed almost before it starts (Buhl, 1975; Detweiler, 1973; Diamond, 1971; Diamond, 1974; Diamond *et al.*, 1975; McMillan, 1975; Schauer, 1971).

ADMINISTRATIVE LOCATION OF INSTRUCTIONAL DEVELOPMENT AGENCIES

In order to provide a catalyst for change and to support faculty in their attempts at innovation, some sort of instructional development agency or program should be established. The administrative location of such an agency or program should be such that it reports to the chief academic officer of the institution. Access to this level of administration is important since a wide-ranging instructional development program may have institution-wide impact and may necessitate institutional policy changes, reallocation of financial, material, and human resources, or may require other high-level administrative decisions and support (Alexander and Yelon, 1972; Detweiler, 1973; Diamond *et al.*, 1975; Heinich, 1971).

INSTITUTIONAL REWARD STRUCTURE

The institutional structure must reward faculty for quality teaching and innovation in instruction. Rewards such as campus recognition, faculty teaching awards, and the like are a step in the right direction, but they are not enough. The most effective rewards are in the nature of official recognition by the institution in terms of promotion, tenure, salary, and other marks of status. Instructional development agencies should play a part in attempting to change the institutional reward structure where necessary so that faculty may benefit in a concrete manner from their attempts at innovation (Alexander and Yelon, 1972; Buhl, 1975; Detweiler, 1973; Diamond, 1974; Diamond *et al.*, 1975; Gaff, 1975 a, 1975 b; Group for Human Development, 1974; Hoban, 1974; Holsclaw, 1974; McMillan, 1975).

INSTRUCTIONAL DEVELOPMENT PROCEDURES

There are many different "models" or instructional development processes which are followed by various instructional development agencies. Each model represents a particular individual's or agency's method of applying a systematic process to the development of instruction. Little research exists to guide an agency in selecting or developing a model to follow, but the advice from the literature seems to be clear that some sort of instructional development procedure should be adopted and followed in order to facilitate the development process and assure communication among the individuals involved (Diamond, 1971; Diamond, *et al.*, 1975; Hamreus, 1971; Holsclaw, 1974; Lee, 1971; Schauer, 1971).

TEAM APPROACH TO INSTRUCTIONAL DEVELOPMENT

The complex nature of the academic change process and the comprehensiveness of a systematic instructional development effort require many sets of talents and areas of expertise. The use of a team approach, involving several faculty members and various professionals in instructional development and evaluation, is highly recommended as a method for bringing varied human resources to bear on this complex task (Diamond *et al.*, 1975; Faris, 1970; Gustafson, 1971; Lee, 1971; Wittich and Schuller, 1973).

FACULTY DEVELOPMENT

Producing meaningful, long-range academic changes in higher education requires that faculty be effectively involved in the instructional development program. Attention should be paid to the development of faculty members' skills in instructional development. The majority of opinions offered suggest that a major goal of any successful program should be for faculty to become instructional developers in their own right (Abedor and Gustafson, 1971; Beilby, 1974; Briley, 1971; DeBloois and Alder, 1973; Faris, 1970; Gaff, 1975 b; Group for Human Development, 1974; Gustafson, 1971; Gustafson, 1975; Hoban, 1974; Roueche and Boggs, 1970; Ullmer and Stakenas, 1971).

Various workshops and training sessions have been advanced as ways to achieve this objective; however, little data about the long-term effectiveness of these approaches are available. Hammons (1975) reported that short-term workshops by themselves have not proven to be effective in producing long-range change. He suggested that certain follow-up activities be included in order to maximize the impact of workshops. In addition, he listed a set of guidelines to be followed in the development of workshops intended to improve faculty skills in the teaching-learning process.

MAXIMIZING IMPACT

To have maximum impact on institutional programs, instructional development agencies should identify the top priorities of the institution and choose projects which reflect these priorities. The goal should be to complete a few major projects which have widespread impact rather than to support numerous small projects which have little overall impact on the nature of the academic program. In addition, every possible attempt should be made to assure the long-term stability of the project. A key first step in the process is to select projects from departments where the staffing pattern is relatively stable and where the political climate is free from divisive problems which would eventually doom any project to failure. Another step toward stability is the involvement of more than one faculty member in the project, thereby assuring that

other faculty members will be able to carry on the project even if a key person leaves the institution. Finally, the agency should structure the conditions for institutional support of the project so that after the developmental stage is completed the institution will continue to support the new course as a part of its normal academic program (Diamond, 1971; Diamond *et al.*, 1975; Haney, Lange, and Barson, 1968).

INCLUDE EVALUATION

The consensus in the literature is clear that any instructional development effort must include evaluation. Evaluation can help insure more successful projects by informing the development process, but it is also important to assist the institution in judging the worth of the instructional improvement enterprise. Without adequate evaluation, it is not possible to describe accurately what was accomplished. Instructional changes, attitude changes, program effectiveness and efficiency, student learning, and faculty attitudes should all be examined as a part of the evaluation process (Diamond, 1971; Diamond, *et al.*, 1975; Engel, 1969; Gaff, 1975 b; Gerlach and Ely, 1971; Gustafson, 1971; Hamreus, 1971; Holsclaw, 1974; Lee, 1971; Popham, 1974; Schauer, 1971; Wittich and Schuller, 1973).

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CHAPTER VIII

INSTRUCTIONAL IMPROVEMENT CENTERS IN HIGHER EDUCATION

By
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This chapter contains a description of the research strategy and subsequent results of a study to gather information about instructional improvement centers in higher education. Gaff (1975) defines an "instructional improvement center" (IIC) as "an organization that is charged with the responsibility of facilitating the continuing development of professional and personal competencies of faculty, particularly those that lead to the improvement of teaching and learning" (p. 114). Gaff describes a typical IIC in these terms: "It has a permanent professional staff of modest size, administers a small grant program for instructional innovation, provides consultation to interested faculty, works with teaching assistants, and generally acts to emphasize the importance and improve the quality of teaching" (p. 115).

This study grew out of a pragmatic need. Working with administrators and faculty at his home institution, the author noted their curiosity concerning instructional development activities at other universities. Frequently, specific questions were asked about campus-wide centers. The number of professional staff employed in the centers, the types of activities the staff performed, the goals of the program, and the financial support were some common concerns. In some cases the questioner's intent was to compare the home institution with others similar to it. In several instances, too, the author would have found it valuable to have had at his disposal the information about other comparable institutions' efforts at instructional development. Hence, a study was undertaken to gather information about campus-wide IIC's at higher education institutions which were similar to the University of Iowa.

The goals of the study were to collect "hard data" on four issues surrounding these centers: 1) staff and organization, 2) professional activities, 3) financial support, and 4) philosophy and future direction.

A review of the literature uncovered a paucity of studies which report data regarding these issues for specific kinds of educational institutions. Alexander and Yelon (1972), Gaff (1975) and McMillan (1975) gathered survey data about instructional improvement centers, but in each case the information was drawn from higher education institutions in general. No reports were located in the literature which provided information related to specific types of institutions. The above publications, though, were very helpful in suggesting the range, type and format

of questions to be asked in future studies.

It was decided to collect the information first hand via a questionnaire sent to the directors of IIC's in selected higher educational institutions. An institution was selected for inclusion in this study if it satisfied any one of the following three criteria.

The first criterion was developed by the author to reflect the "personality identification" of the institution. It stipulated that the institution must be located in a state which contained a Big Ten or Big Eight school, was state supported, offered graduate degrees beyond the masters' level and had a 1974–75 enrollment over 14,500 students.

The second criterion concerned "academic role" and was adapted from Gross (1968). This required that the institution grant the Ph.D. degree in four fields (humanities, biological sciences, physical sciences, and social sciences), that the doctorate degrees granted in the two least emphasized fields exceed 10 per cent of the total degrees conferred, that there be a liberal arts undergraduate school and at least three professional schools, that the school granted ten or more graduate degrees in 1963–64, and that the institution was state supported.

The third criterion focused on the "research orientation" of the institution. It demanded that the institution be identified as a Research Institution I according to the Carnegie Commission on Higher Education (1973) and that the student enrollment exceed 10,000.

Eighty-eight institutions were identified as satisfying one or more criteria and therefore were qualified for inclusion in the study. Further investigation disclosed that campus-wide IIC's were in operation at only 40 of the eligible institutions.

Identifying the IIC director to whom to send the questionnaire at each of the 40 institutions proved to be a difficult task. It was often necessary to personally contact professional colleagues around the country in order to identify the prospective respondents.

A 21-item questionnaire was developed to address four issues. Six questions were asked which were related to professional staff and organization. Eight questions concerned professional activities. Two questions sought information relative to financial support. Five questions inquired about philosophy and future directions.

The questionnaire was mailed to each of the 40 IIC directors in March, 1976. Follow-up efforts to retrieve the questionnaires included a second mailing and a phone call to non-respondents. Thirty-three of the 40 directors returned the questionnaire – a response rate of 82%. However, seven of the centers were dropped from the study when it was learned that they were no longer in operation or served only limited segments of the campus. This left questionnaires from 26 campus-wide IIC directors to serve as the data base for the study.[1]

Findings of the Study

The majority of the findings of the study will be reported as averages or percentages of the total response. In some cases the actual number of the responses will be given separately for each of the two groups, the 12 relatively newer centers (less than five years old) and the 14 older centers (five years or more). It is important to note that nearly 50% of all the centers contributing to the study have been in existence for less than five years.

PROFESSIONAL STAFF AND ORGANIZATION

FULL-TIME PROFESSIONAL STAFF

The number of full-time professionals employed by each center ranged from 0 to 25 employees. One-half of the centers, however, employed only one, two or three persons. The average number of professionals in the newer centers was 2.5 while in the older centers it was 7.3. Two older centers listed their professional staff size as 18 and 25, respectively.

These full-time professionals represented a broad range of academic disciplines and fields of experience. The largest group, 43%, came from Education, 12% from Psychology, 6% from Communications, and 5% from English. One or two staff persons were identified from each of the following areas: Art, Biology, Chemistry, Cinema, Classics, Computer Sciences, Criminology, Engineering, Genetics, Mathematics, Physics, Sociology, Speech, and Statistics.

Within the Education group, the most prominent speciality was Educational Psychology followed closely by Educational Technology or Instructional Design. Higher Education and Counselor Education were also mentioned frequently. Other reported subgroups were Educational Measurement, Curriculum and General Education.

Institutional support for the salaries of the full-time professional staff ranged from 0% to 100%. Sixteen of the centers (64%) reported all their full-time professionals were paid entirely from institutional "hard" funds – as opposed to outside, "soft", funding sources. Seven of the 12 newer centers said this was the case, as did nine of the 14 older centers. The institution contributed at least two-thirds of the salary support in four centers, but in two instances no institutional support for salaries was provided.

PART-TIME PROFESSIONAL STAFF

Approximately 60% of all the centers reported employing part-time professionals. The number of these employees per center ranged from 1–10 with an average of two. Part-time professionals were found more frequently in the newer centers.

NONPROFESSIONAL STAFF

All of the centers but one reported the employment of full-time nonprofessionals. The number of these employees per center ranged from 1 to 34; however, one-half of the centers employed three or less. An average of two nonprofessionals was employed in each newer center while a mean of six was working in the older centers.

LOCATION IN THE INSTITUTION

In all cases each center was located high in the institution's organizational structure. Fourteen of the directors (56%) reported to the institution's Vice-President for Academic Affairs (or chief academic officer) and 44% reported to a dean, director, or associate vice-president who in turn reported to the Vice-President.

PROFESSIONAL ACTIVITIES

ROLES

When offered two different descriptions of IIC activities, one focusing on a service orientation, the other centering on faculty development, 50% of the directors selected the latter as the best reflection of their center. Twelve per cent identified with the service role. Thirty-eight per cent, however, indicated that they performed in both roles or that the descriptions were too narrow and that their centers offered much broader programs. One respondent, for example, wrote: "We assist, encourage and facilitate efforts of the faculty to improve their instructional activities, to explore educational innovations and to evaluate the quality of their educational efforts."

FACULTY REWARDS/INCENTIVES

All of the respondents reported that their institutions provided some type of reward or incentive to faculty who engaged in instructional development activities. In most instances more than one type of reward was available. Offering the faculty small project grants was by far the most popular as it was used by 22 (85%) of the institutions. About 50% offered promotional considerations, reduced teaching loads, and leaves of absences as incentives. Eight institutions provided copyright privileges and/or salary increments.

CLIENTS

Ten of the respondents (38%) reported that they had either no information or limited information about their clientele. Several offered estimates. From the data provided, it appears that 36% of the centers' clients were basic and applied science faculty, 32% liberal arts faculty, and 24% were professional school faculty.

Both tenured and nontenured faculty were reported to use the centers; each group made up approximately 40% of the total clientele. Others who reportedly made use of the centers were department chairpersons, graduate teaching assistants and off-campus clients.

It is interesting to note that one-half of the newer centers and nearly one-fourth of the older centers acknowledged that they kept either no records at all or only limited records regarding the characteristics of their clientele.

Fourteen, or slightly more than 50% of the centers reported that they maintained a laboratory or other facility specifically for research and development in instruction.

Nearly all the directors (88%) indicated that a faculty advisory committee helped to determine the center's policies and activities.

A large number of the centers (62%) provided assistance to individuals or agencies located outside of the formal university structure.

Only eight centers (31%) reported that they evaluate faculty teaching for purposes of promotion or tenure. In fact, several respondents added comments emphasizing that the evaluation of teaching was definitely not a part of their activities.

STAFF ACTIVITIES

Three IIC directors did not respond to items concerned with staff activities, and several others reported they could provide only estimates concerning the percentages of time their staffs spent on selected kinds of tasks. Bearing this in mind, it appears that the average center staff spent about 40% of its time working on individual course revision, 8% of its time with department-wide course revisions, 4% of its time in college-wide curriculum revisions, and 18% of its time in other activities including research, writing grant proposals, presenting workshops and administrative duties.

When asked if they would like to change the percentage of time the center's staff spends on each of the above activities, twelve, or nearly 50%, of the directors stated they would like to do so. Six each were from older and newer centers. In general, the directors envisioned reducing the amount of time spent in individual faculty projects and course revisions while increasing the time spent in department-wide and college-wide activities. The general feeling seemed to be that these changes would increase the impact and effectiveness of the centers in their institutions.

STRATEGIES

EFFECTIVE STRATEGIES

Techniques which the centers have found the most effective in eliciting faculty support and encouraging the faculty's use of the centers' services fell under three general headings. The most frequently

mentioned technique was personal contact. This included promotional mailings to the faculty, relying on satisfied client's word-of-mouth promotion and conducting workshops designed to meet faculty needs.

Projecting a service orientation was another commonly mentioned technique. Respondents said that they found it valuable to downplay the professional educator role and missionary orientation, that they seek out and attempt to meet faculty needs, that they try to create a nonthreatening climate with respect to change, that they zero in on specific projects and that they attempt to develop a respected performance record of high quality.

Providing incentives and rewards for faculty engaging in instructional development was the third most often mentioned technique. Activities most often cited took the form of the examples mentioned earlier, such as mini-grants for specific projects, reduced teaching loads and leaves of absence while engaging in instructional development projects.

INEFFECTIVE STRATEGIES

The respondents' warnings about ineffective strategies did not fall into identifiable categories. Some suggested that any activities that interfered with strategies already known to be effective would certainly be deleterious. Beyond that the respondents each seemed to have discovered their own poisons. Some examples of ineffective strategies which were mentioned were acting too aggressively, offering workshops of a general nature, offering workshops on specific topical subjects, distributing too much promotional literature, not publicizing the availability of the center's services and appearing to act as a servant of the central administration.

FINANCIAL SUPPORT

BUDGET SOURCES

Eleven centers (42%) reported that their entire operating budgets came from their institution's hard dollars, while only one director (4%) reported total reliance upon non-university financial support. The other 14 centers (54%) reported that their budgets were supported by some mix of university, government and private funding, with half of these (27%, or 7 centers) reporting that university funds made up 75% or more of this mix in their cases. It is interesting to note that while only two of the newer centers relied on federal or state government grants, seven of the older centers used these sources. On the other hand, while seven of the newer centers made use of foundations or private grants, only two of the older centers did so.

OPERATING BUDGETS

The annual operating budgets for the centers for 1975–76 were reported to range from $25,000 to over $500,000. As might be expected, the size of the annual budget correlated strongly with the number of persons employed in the center. Two-thirds of the newer centers reported annual budgets under $100,000 while two-thirds of the older centers reported annual budgets in excess of that amount.

PHILOSOPHY AND DIRECTION

INSTITUTION INNOVATIVENESS

About one-half of the respondents regarded their institutions as "average" relative to innovative teaching practices when compared to other universities. Slightly less than half believed that their institutions were more innovative than most while a few perceived theirs as conservative. No directors felt that their institutions were either extremely innovative or extremely conservative.

IMPETUS FOR ESTABLISHING THE IIC

The respondents found it difficult to identify the major impetus for establishing their centers. Many felt that there were several driving forces working in combination. Most often mentioned as sources of impetus were the university's central administration and the university faculty. A number of the directors credited their own personal efforts. In no case was the institution's governing board or the state legislature credited with providing the impetus.

FUTURE DIRECTIONS

The directors predicted that changes would occur in their IIC's over the next three years. The types of changes suggested fell into four broad categories. The most often cited change involved efforts at redirecting the activities of the center away from individual faculty projects and toward department-wide course projects. Also mentioned was the placing of more emphasis on the development of individualized learning designs and the providing of seminars and workshops for faculty and teaching assistants. Some single responses concerning a redirection of efforts included increasing involvement with continuing education, moving from an instructional development orientation to a larger faculty development role and attempting to modify the university reward structure in order to promote the use of the IIC.

A second major emphasis in the future, according to the respondents, would be on evaluation and research. Many of the directors indicated that their centers would become more involved in the evaluation of student learning, of faculty teaching and of the effectiveness of the centers themselves. Some specific areas of research which were cited were

student performance measures, faculty growth contracts and institutional research.

Five respondents indicated that expansion would occur in the future. Several reported that they would become involved with an increasing number of faculty and department projects within the university as well as expanding to serve off-campus clientele. Two respondents said that they expected to enlarge their staffs. A few directors believed that they would have to rely less on outside soft money for support and one predicted the expansion of the center's audiovisual services.

Five respondents anticipated budget reductions in the future. Two of these directors reported that their grant support would stop during the next three years and that they must seek other funding sources, while three respondents were concerned that their institutional fiscal support would be lessened.

REASONS NOT TO ESTABLISH AN IIC

When asked for their opinions concerning why a higher educational institution might *not* establish an instructional improvement center, the respondents posited that the resistance would come from the faculty and/or the administration, and would be based upon the past record of established instructional improvement centers.

Faculty fear of change was suggested most often as a reason for the absence of instructional improvement centers. In addition to a disruption of the status quo, departments and colleges may see a center as a threat to their autonomy. From a different perspective, faculty may oppose the IIC concept because the improvement of teaching is not given a high priority; they are convinced that their teaching is already excellent and therefore such a center is not required.

Reasons suggested why the university administration might reject an institutional improvement center proposal included these perceptions: (a) there is no need – such a center would simply consume valuable time and resources; (b) an IIC is a frill which can be ill-afforded at a time of high competition for scarce resources; and (c) the existing academic departments and campus services are capable of handling instructional problems on their own.

Existing IIC's in other institutions may also provide reasons for resistance to the establishment of new ones. There is little data which can be used to demonstrate the existence of a positive impact of the centers. Many centers can show only mediocre performance records in terms of the total number of clients served, for example, and therefore it is difficult to justify their cost by this criterion.

Observations and Summary

Data from the study provided a snapshot of the status of IIC's in large institutions of higher learning. While no two centers were exactly alike, there were enough similarities to develop an image of a "typical" IIC, especially for the center which had been in existence for less than five years.

The average newer IIC was staffed by one or two full-time professionals with the assistance of a part-time professional. These professionals most likely represented some speciality within Education or Psychology. Several nonprofessional clerical personnel were also employed by the center. The center director reported to the chief academic officer of the institution. A faculty advisory committee assisted in determining the center's policies and activities. The activities of the center included a combination of service functions (e.g., writing course objectives, producing instructional materials, conducting student evaluations) and faculty development functions (e.g., teaching the faculty how to write objectives, how to select appropriate teaching strategies, and how to carry out formative evaluation). Incentives were provided to the faculty in the forms of mini-grants for specific projects, promotional considerations, reduced teaching loads and leaves of absence with pay. The clients who used the center's resources included both tenured and nontenured faculty and graduate teaching assistants. The clients were distributed rather evenly among the liberal arts, science and professional school faculties. The specific projects undertaken by the center's staff most often centered around individual faculty projects. The typical center promoted faculty support by establishing a respected performance record which met faculty needs and by creating a nonthreatening climate in which the faculty could experiment with innovative instructional techniques. The center conducted faculty inservice workshops and distributed promotional literature. It also relied heavily on satisfied clients to inform colleagues of the center's services. The center assiduously tried to avoid any activities which smacked of pressuring the faculty to use its services. The annual operating budget was under $100,000 with well over one-half of that amount coming from the university's general fund and the remainder supplied by outside grant support. It is highly likely that the impetus for establishing the center came either from the university's central administration or the faculty.

The results of the survey also raised some concern for certain areas of operation. The staffs of the centers represent a relatively narrow segment of the disciplines and speciality areas present on major university campuses. Therefore, it would seem advantageous to recruit

some center staff who represent areas other than Education and Psychology.

The IIC's apparently keep few records which document who their clients are and what activities the staffs engage in. This lack of documentation was clearly visible in the study. In addition, little evidence was offered to assess the impact and overall effectiveness of the centers within the institutions. It is important that criteria for evaluating each center's relative effectiveness and concomitant data-gathering procedures be developed.

Difficult to document or measure, but nevertheless present in the written responses to the questionnaire, was a sense of uncertainty on the part of the directors as to how to best proceed. This should not be construed as an indication of poor leadership. When examined closely and sympathetically, it is apparent that the directors and their staffs are working in new roles. There are no historical guidelines to follow, and the goals and objectives are often imprecise and evolving. While the staff is there to help others, there is often no one to help the staff. Some mechanism, similar to the Professional and Organization Development Network in Higher Education, should be established to enable these staff persons to communicate with one another to share their triumphs and their failures with one another.

It must be borne in mind that this study surveyed the status of IIC's from the viewpoint of the directors of these centers. It is reasonable to assume, therefore, that to some degree the data are biased. Future studies of IIC's might include the gathering of data from the faculties served by the centers as well as from the universities' chief administrative officers.

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FOOTNOTES

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[1]The following institutions provided the data reported in the study: University of Alabama, University of California – Berkeley, University of California – Davis, Cleveland State University, Colorado State University, University of Delaware, Florida State University, University of Florida, University of Illinois – Champaign-Urbana, Southern Illinois University – Carbondale, University of Kansas, Kent State University, University of Massachusetts, Central Michigan University, Michigan State University, University of Michigan, Western Michigan University, University of Minnesota, University of Nebraska – Lincoln, Northwestern University, Oklahoma State University, Pennsylvania State University, Purdue University, University of Tennessee, University of South Carolina, and University of Texas. The author is indebted to all of the center directors who contributed to the study.

CHAPTER IX

POLITICS OF INSTRUCTIONAL DEVELOPMENT IN HIGHER EDUCATION

By
Robin Edgar Lawrason

The literature on the theory of instructional development is voluminous. Every ardent ID specialist is able to write with precision and specificity concerning the construction and testing of instructional products. A more relevant problem for developers, however, is not how to do ID, but how to get it done at their own campus. Academic ID programs have given considerable training in instructional process skills, yet little in the way of personal or political skills.

Those within the profession generally agree that ID involves a systematic process whereby instructional problems are analyzed and solutions developed and tested, with the goal of improving the achievement of learners. The process has been described with the aid of models or flow charts illustrating the numerous instructional variables and the interrelationships among them (Baker and Schutz, 1971; Davies, 1971; Davis, Alexander and Yelon, 1974; Gerlach and Ely, 1971; Popham and Baker, 1970; etc.). Components of the process include the analysis of learner variables, the specification of content and of performance objectives, the development of both teaching and learning strategies together with appropriate resources, the allocation of space and time, and the evaluation of learner skills, instructional products and procedures.

The majority of writers, however, concentrate on those variables related to the instructional act itself: learner characteristics, subject-content hierarchies, the specific teaching procedures and products. The study of such variables as performance objectives, prompts, practice, feedback, and various instructional methods is an essential task of the researcher and developer in determining their effects upon learner achievement. Scientific development of an individualized freshman English program, however, is by no means an assurance that the innovative course will be implemented.

Implementation of any instructional development project within an institution of higher education is not an easy task. It requires considerable time, energy and commitment. Any project undertaken in the hope of achieving significant results requires extensive planning, controlled implementation, and continued evaluation over time. The text book ID

approach prescribes important decision-making tasks as well as the time-consuming production requirements throughout the project. The process must also take place within an institutional context, and thus, must interface with yet another system which has its own range of controls, variables, and priorities. Approvals and arrangements are required from faculty through policy or curriculum committees and from administrators concerned with funds, resources, time and space. Ironically in many institutions of higher education, it is not uncommon to find that the priorities and procedures of the academic community and of the administrative structure conflict with those of individuals who are seriously concerned with improving the quality of instruction. An ID team may have spent many months developing a new freshman English course, with individualized learning modules, based on the principle of student mastery performance. After testing the new units with students the team discovers significant increases in both learner achievement and motivation. These innovators may be congratulated for their research, but if they were to attempt to implement the new course they would most likely be criticized by angry administrators and colleagues who are afraid of "grade inflation".

It has become increasingly evident in recent years, therefore, that the successful instructional developer must also become a change agent. As a change agent the ID professional must be willing to identify, utilize and attempt to modify the institution's political power structure in order to develop policies that lead to meaningful improvement of instructional programs. The research of other social scientists interested in the study of change, innovation, or the diffusion of new ideas can be helpful to the ID professional. The study of change in itself has become a discipline with its own systems and theories. Recent reviews of change literature by Chin and Downey (1973), and Giacquinta (1973) provide evidence of the extensive research in this field. The ID community must be able to use this new change theory to develop strategies and isolate factors that can aid in the diffusion of the results of its developmental projects throughout higher education.

POLITICAL ID SUCCESS FACTORS FROM THE LITERATURE

Many educators have been concerned about implementation from an administrative or curricular standpoint. An excellent review of implementation or organization system models is provided by Baker in Travers' *Second Handbook of Research in Teaching* (1973). These models, however, are concerned with theoretical constructs based on a stable environmental context. Teaching or conducting ID in higher education today cannot be said to occur in a stable environment. Both tangible and intangible factors are at work within the complex matrix of an institution. Little research has yet been conducted that can

determine the relative importance of those factors which could facilitate ID in higher education. Identification of those significant factors, however, is not enough. Study must also be made of strategic interrelationships, not only among factors, but also in interaction with those involving the loci of political control within the institution.

Comparison of published studies of factors influencing the implementation of ID products is difficult because much of the research to date has either been too abstract, written in terms of general administrative or organizational theory; or else it has been anecdotal, pertaining to specific ID programs within a single institution. Another problem in comparing studies is created by the differing perceptions various people in the academic community have of ID. The research-oriented developers tend to stress their concerns for maintaining controlled variables in the application of their theoretic process. Producer-developers meanwhile are more concerned with providing adequate material resources and staff and perhaps even with the development of a marketable product. Administrators, pushed by politicians, are often concerned with the basic productivity and accountability of their faculty and staff. Faculty, on the other hand, are concerned with maintaining academic control, as well as receiving both the needed time and rewards for their ID efforts. All groups are legitimately concerned with an even more essential factor: the financial support for providing ID work. Research that attempts to examine change or innovation strategies is thus often confounded by the wide range of perspectives to be found on the subject within the academic community.

Despite these difficulties it is possible to find some consensus in authors writing about successful ID projects concerning factors that contributed to that success. At least eight factors are commonly reported in the literature.

1. COMMITMENT BY THE INSTITUTION

This rather general factor was identified as essential in the establishment of an effective program of instructional development on campus by the majority of the authors reviewed. Both Diamond (1974) and Purdy (1975) state that the administration is responsible for the internal campus communication system and for addressing both problems and the need for change. Whitefield and Brammer (1973), DeBloois and Alder (1973), and Lee (1971) all stress that this support must be forthcoming from either the president or provost in charge of academic affairs. The creation of an "innovational climate" by the administration is also stressed by Alexander and Yelon (1972), Diamond (1975), Lee (1972) and Purdy (1975).

Commitment by the administration, however, is measured by most authors in terms of budgetary support for ID Centers: DeBloois and Alder (1973); Diamond (1975); Lee (1971, 1972); Popham (1974); Stowe (1971); and Whitefield and Brammer (1973). This specific factor is clearly the success variable most frequently cited by those ID Centers canvassed by Alexander and Yelon (1972).

Another indication of the administration's commitment which appears to effect the success of ID programs is the position of the ID Center within the hierarchy of the institution. In reporting on fifteen ID Centers currently in operation throughout North America, Alexander and Yelon (1972) report that the majority were operated from a central position, whereas the remainder were operated within individual Colleges or departments. Diamond (1975) stresses the necessity for ID services to be controlled centrally with decision-making policies being made at the Vice Presidential level where communication is clearly defined between colleges and departments. Lee (1972) also argues that the director should not only be given academic rank equal to faculty colleagues, but also should have the power to make policy decisions in relation to the ID projects under development. In describing their own operations, four of the fifteen Centers in the Alexander and Yelon study specifically mention the position of the ID Director in the administrative hierarchy as an essential factor controlling his success.

2. FACULTY REWARDS

The current reward structure commonly found, particularly in older institutions of higher education, has had a strong negative influence upon efforts to improve teaching and learning. Benston (1973) repeats the common argument that faculty are rewarded for research, not for teaching. Good teaching, he argues, does bring a certain level of prestige to the professor, but instead of positive reward, a good teacher finds the work load is increased when improvement efforts are undertaken. Benston, as well as all other authors reviewed, stresses the importance of providing incentives for improvements in teaching through changes in current out-dated standards for promotion, merit, tenure, release time and so on.

3. SKILLS OF THE ID STAFF

The first success factor which is related to variables within the ID Center itself appears well down the list, below the previous two factors which were related to the administrative structure of the campus. The most important internal factor described by most authors relates directly to the range and quality of the professional skills available to faculty at the Center. Specific skills mentioned by authors included personal dynamics skills, such as diagnosis of personal needs and counseling; skills

required to move through the ID process, such as the definition of goals, selection of strategies, etc; technical skills related to the design, production and implementation of instructional materials; and skills related to the evaluation of needs, people, materials and programs: Alexander and Yelon (1972); DeBloois and Alder (1973); Diamond (1975); Lee (1972); Lindquist (1975); Purdy (1974); and Whitefield and Brammer (1973).

4. RESOURCES AND FACILITIES

Closely related to the "human" resources noted above, most of the same authors cite the need for physical resources and facilities. These include office, library and media resources (both hardware and software) necessary for the design, production, implementation and evaluation of new teaching resources and programs.

5. EVALUATION OF PROGRAMS

A smaller number of authors stress the need for programs of evaluation. Diamond (1974) sees evaluation not only as a part of the revision cycle, but also stresses a type of evaluation at the "front end". He calls for both the administration and the center to have clearly identified goals and objectives, presumably to provide guidance in the selection of development projects, as well as to provide a yardstick against which to measure the final effects of the programs under development. Popham (1974) stresses the need for focusing on student achievement as a means of getting at the complex and difficult task of measuring teaching effectiveness. Both Lee (1971) and Lindquist (1974) cite overall program evaluation as another essential consideration. In the review of ID Centers by Alexander and Yelon, several Centers list evaluation of ongoing programs as a key factor, and stress the need for consistency in evaluation procedures.

6. FACULTY OPENNESS TO CHANGE

The strongest evidence of the importance of this factor is found in the Alexander and Yelon book. At least nine of the fifteen ID Centers stress this issue, making it second in importance only to budgetary support as a critical factor in the promotion of instructional development on campus. Lindquist (1974) devotes his article to a consideration of "change models" useful in promoting innovation on the campus. Purdy (1975) states directly that the faculty's openness to change will seriously effect development efforts on campus. Both Lindquist and Purdy, however, suggest that unless faculty are involved in the change process the efforts of the administration may be in vain.

7. STUDENT ATTITUDES

Few articles directly consider the needs of students, or try to relate their attitudes to the development process. Only two of the fifteen Centers in the Alexander and Yelon book mention the importance of positive student attitudes. Diamond (1975), however, lists "a relevant curriculum" as a primary factor. He explains that the curriculum should be relevant to the present and future needs of the student, as well as to the community, to society, and to existing psychological and social factors.

8. FOCUS OF THE ID CENTER

This factor seems to be a concern primarily of those ID Centers that have developed beyond early stages. Diamond (1975) stresses the need for the ID Center to focus on large scale projects which utilize the full range of the ID process. By selection of well planned projects with good prospects for success, and by following through on all development phases on a collegial or departmental level (rather than on an individual or course level), projects have a better chance of survival, as well as a better chance of having a significant effect upon a wide group of learners and faculty. In the Alexander and Yelon book, at least one third of the ID Centers included level of focus as an important success variable in the operation of their ID programs.

A recent study (Lawrason and Hedberg, 1977) attempted to determine whether there was any correlation among the perceptions held by various university people with respect to the relative importance of a range of factors which could conceivably effect the success of ID efforts. Subjects were taken from two major northeastern universities. They included faculty, administrators, ID staff, and ID graduate students. Each was asked to rank the importance of twenty specific factors, then rate (on a scale of 1 to 5) the manipulability of each factor within the institution. Manipulation was rated in two areas: the ability of the factor to be manipulated by the ID Center, and for it to be manipulated by the administration.

While the study was not entirely successful in producing a generalized systems model that demonstrated consistent interrelationships among factors, a number of important trends were noted. In overall ranking the administration's support of the ID Center was selected as the most important factor. When weighted averages were formed (ranking x rating), this factor was again first in the administrative control column. It was third, however, as a factor that could be manipulated by the ID Center itself. The second ranking factor also involved administration: budgetary support. Skills of the ID director and staff were next in line, highly rated in terms both of the administration's and of the ID Center's ability to control.

An interesting observation in the study, moreover, was that subjects tended to respond according to their individual concerns rather than their academic roles. Factors clustered into four response patterns: administrative support, instructional development policy, campus climate, and IDC image. Subject groups tended to consistently favor one cluster of factors or another; no correlation was found between the status of the members of the groups and their perceptions of the locus of control for making ID work successfully.

Perhaps the most important conclusion of the study relates to the political environment of the campus in relation to the ID Center's position in the administrative structure. An ID Center cannot exist successfully alone. While it can control to some degree the quality of director and staff, instructional products and the diversity of services offered, the more essential controls are related to areas outside its purvue: administrative support through funds, rewards for faculty, position of the ID Center and director in the university hierarchy, and the innovative climate among administrators and faculty.

The Lawrason and Hedberg study attempted to examine the relative importance of ID implementation strategies, but was limited to responses based on perceptions acquired through personal training or experience. Much of the current literature on implementation and diffusion deals with such personal theories of advice to prospective change agents. There are few studies in which a range of ID projects are analyzed in terms of specific administrative and political factors. One such study, The Rand Report, reviewed by Berman and McLaughlin (1976), examines specific federal projects for change in education. The multi-volumed Report examines project outcomes in terms of perceived success, changes in behavior, fidelity and implementation within the institutional setting.

The purpose of the present study, therefore, is to compare recently published theory with the reported practices of those institutions which are currently involved in instructional development projects. In this way one can compare current theory with practice and gain a better perception of the actual role of the ID professional within the political hierarchy of the institution. Questions raised in the study were, basically, who promotes ID? Who does ID? Who pays for ID? and how is ID implemented and evaluated within the institution?

A Delaware Valley ID Project Survey

METHOD

The study surveyed sixteen representative institutions in the Delaware Valley region. The geographic region of southeastern Pennsylvania and southwestern New Jersey represents an area containing approximately eight million inhabitants with a geographic center in Philadelphia. The region is composed of high density inner city neighborhoods, a variety of surrounding suburban communities, as well as large rural areas.

Included in the survey were five two-year community colleges, five four-year private colleges, one four-year state college, three private universities and two state-related universities. Contacts were made with principal academic leaders who referred the investigator to projects in progress within each institution.

Data was then collected by the investigator, primarily through telephone interviews. In some cases on-site interviews were conducted to gain additional information or insight into the nature of the project. During the pilot testing of the data form (Appendix A), it soon became evident that answers given by respondents to the simplest questions often were qualified, and that additional information was necessary before the responses could be placed in a proper context. The vast differences in the level, scope, content and organization of the projects surveyed made data collection a most difficult task. Thus, it was decided that the phone interview procedure would be more efficient than mailing the forms to project directors. Moreover, given the return rate normally experienced with such forms, the direct interview approach was also deemed to be more likely to procure the required data.

Respondents were first read the following introductory statement, which includes a definition of an instructional development project:

> I am currently making a survey of instructional development projects for a research paper that I am writing. The purpose of my paper is to provide useful information to other developers about the various ways ID projects are organized in terms of the administrative structures of the institution. I am defining an instructional development project as any project that involves the following stages of development:
>
> 1. a proposal stage to gain financial support (either internal or external).
> 2. a goals stage where student performance objectives were specified.
> 3. a design and production stage where instructional procedures and materials were developed to help students reach the stated goals.

4. an evaluation stage where procedures and materials were tried out with representative students and measured for effectiveness.

Has your institution had any such projects under development over the last year?

If respondents felt that their project qualified as an ID project, the investigator proceeded with the questions listed on the data form.

RESULTS

A. PROJECTS BY INSTITUTION

The sixteen regional institutions surveyed reported twenty-eight ID projects, distributed according to Table 1. The five community colleges accounted for eleven of the total, the five private four-year colleges four, and the single state college one. The two state-related universities reported six projects in the survey, while the three private universities also reported six.

TABLE 1. PROJECTS BY INSTITUTIONS

Institutional Level	Number of Institutions	Number of Projects
Community College	5	11
Private Four-year	5	4
State Four-year	1	1
State-related University	2	6
Private Universities	3	6
	16	28

B. PROJECT ACADEMIC SUBJECT AREA

A full range of academic subject areas were represented in the 28 projects surveyed. Education projects accounted for the greatest number with five projects. Interdisciplinary studies projects involving three or more subject areas (primarily Humanities and Social Science areas) had four projects in progress. Science, Mathematics, and Allied Health each had three; Faculty Development, Basic Skills, Engineering, and Social Work areas had two each. Career Education and English both had one project represented in the survey.

C. PROJECT SIZE AND SCOPE

The majority of projects (twenty) involved more than a single course (Table 2). Several of these projects were at the level of a full career-oriented program to train professionals in required competencies. Only one project represented a single workshop session, and the remaining seven projects were at the level of a three credit unit course.

D. PROJECT FUNDS

Funds for ID projects came from a variety of sources. Federal grants accounted for almost half the projects (thirteen), while state aid provided support for only one. The second largest investor was the institution itself. Seven projects were funded from the central administration, two by colleges within institutions, and one by an academic department. The remaining four projects were funded by grants from private agencies.

E. PROJECT MANAGEMENT

1. Rank of the Project Director:

Interviewees from each project were asked to define the principal role of the project director (PD). Seventeen directors out of twenty-eight were faculty within the academic discipline of the project. Three PDs were department chairpersons, four served at the level of academic dean or vice president of the institution and four were ranked as staff positions. The four staff persons were hired specifically for the task of directing their project, while the other twenty-five directors were already at the institution prior to the acceptance of the proposal.

2. Training and Experience of the Project Director:

Ten of the directors interviewed in the survey underwent formal training in the ID process. Another ten of the PDs had some exposure to the concept through workshops, seminars or extended readings. Eight PDs, however, had no training at all for their task. This lack of training seemed to be somewhat offset by the previous experience of most PDs. Nineteen had worked on prior projects, while nine were freshmen to the development process. Of the nine novices, four had neither training nor previous experience.

3. The ID project Team:

In almost all cases the development team involved a number of institutional representatives. Only one project relied wholly upon the director for program input. Another was completed by two people, the director and a top administrator. Fifteen projects were a cooperative effort between the PD and a group of faculty from the academic subject area. Another nine projects involved not only faculty but also a range of specialists including curriculum and evaluation experts.

TABLE 2. PROJECT IMPLEMENTATION/DIFFUSION STRATEGIES

Implementation/Diffusion Strategy		Frequency of Use in Projects*
1.	faculty planning input	17
2.	faculty planning rewards:	
	a. money	9
	b. promotion	4
	c. release time	5
3.	faculty implementation rewards:	
	a. money	9
	b. promotion	3
	c. release time	4
4.	faculty orientation program	19
5.	faculty in service	13
6.	use of validation data	9
7.	teacher self evaluation procedure	11
8.	publicity for ID project	9
9.	continued monetary support	16
10.	external evaluation	12
11.	student opinion data	20
12.	other unsolicited strategies:	
	a. support of administration	13
	b. sale of instructional development product	3

*Total of 28 projects.

4. The Project Staff:

While twenty-five of the projects had some clerical assistance, only a few teams had the services of a full-time secretary. In almost all cases such aid was recruited from existing departmental or institutional pools. Similarly of the nineteen projects that had media specialist assistance, all used regular campus services rather than a full time staff. Ten of the projects had the aid of fully trained instructional development consultants. In most instances this assistance was provided through the director, or a senior academic adviser with advanced training. Only in two instances were professional consultants outside the project approached.

DISCUSSION

It is perhaps misleading to attempt to draw conclusions from the data on whether the size of the institution was related to the number of ID projects identified. The survey did not attempt to include all projects

identified. The survey did not attempt to include all projects underway at each institution, nor were all institutions in the region canvassed. But it was apparent that some institutions seemed to have more projects in progress than others. One of the private state colleges, for example, had three of the total four projects identified for that group. Different philosophies and priorities of the institutions would perhaps account for these differences rather than their size alone. The one most productive college had an administrator who was a positive change agent and who reached into the community as well as promoted ID activity within his own faculty. The other colleges, while espousing improvement of instruction, had not been totally successful in moving faculty out of the traditional limited lecturer/scholar role.

The most ambitious projects in terms of both scope and subject area shared one common factor: all were innovative either in terms of curricular content or instructional technique. For example, several colleges developed new curriculum in allied health, career education, or in the new field of gerontology as a response to community needs and interests. These projects had the highest potential for success for a number of reasons. First, as a response to both community and federal priorities, the projects had selected target areas which qualified for government funding. Second, since the projects were a direct response to a local community need, student populations were assured for the new programs. By selecting new subject fields not formerly taught at the institutions, two project teams overcame one additional obstacle that hampered other projects. These two teams had a clean slate to develop new instructional strategies and policies which would then be established in a new college department rather than in a pre-existing department with all its political and administrative priorities. As noted in later discussion, ID success often appears correlated inversely with the number of administrative committees and levels of control that projects must pass through before receiving approval.

The Career Education Project and several other major projects involved experimentation with inter-disciplinary teaching approaches, or with new learning concepts such as experiential learning, personalized learning, or individualized instruction. All such projects depend upon voluntary contributions by existing faculty. While the potential for change is high, the political realities in sustaining complicated arrangements for assuring continued administrative and faculty support make the full incorporation of such projects into the institutional mainstream less secure.

The role of the ID project director would seem to be a critical one in the development of new instructional procedures and resources. Yet, neither the academic rank nor training of the PD seemed to be

correlated with project approval. The lack of any formal training for the majority of PDs is distressing, particularly to the professional instructional developer. While more than 50% of the PDs had undergone at least informal ID training, the majority were from the academic subject area of the project and lacked the more widely-based educational expertise associated with the professional developer. It is perhaps even more significant to note that only five of the sixteen institutions surveyed have such professional assistance available. In at least three of those institutions that have ID support there has been turnover in these positions due to conflicts between the ID professional and the administration. Only one of the sixteen institutions maintains a Center for Instructional Development as a separate office within the administrative structure.

The implementation and diffusion strategies used were primarily the traditional ones used in most institutions, and the results obtained from their use corroborated current theory. The most successful and commonly used strategy was the involvement of faculty in determining the project content. The means of achieving input varied greatly from forming small committees to gathering data from large numbers of interested faculty. In projects where new subject disciplines were being introduced, this strategy was less useful. One project gathered this valuable input from external subject area professionals, as well as from interested community leaders.

Orientation of faculty before the implementation of the project was a common strategy in many projects, but less than half the projects followed up with continued support for the faculty throughout the first year. Only one third of the projects attempted to convince faculty of the validity of the new procedures by demonstrating successful results from either pilot test data or other successful programs.

Project evaluation was not used widely as either an implementation or a diffusion strategy. While twenty projects did use student feedback, much of this was done in order to fulfill an institutional requirement and was not related to the actual need of the project. Only one third used instructor self-evaluation to give feedback throughout the project implementation; and only one third built in an external evaluation to measure the success of the procedures, and to gain support for the project.

Although directors were not asked specifically about administrative support for their projects, thirteen PDs voluntarily stated that such support was essential. The visibility of their support can be interpreted through several other reported factors. The first indicator comes from their project's source of funds. Only ten of the twenty-eight were funded by the institution itself. In terms of tight budgets

this may not be a true test of administrative support; it may be, however, an indication of the low level of priority that such projects have in relation to other budgetary items. Only those projects that proved cost efficient or generated a larger student population were assured of continued support by the institution after external funds were expended.

A more critical area by which to evaluate administrative support for innovative ID projects is that of faculty rewards for participation in such work. Data indicated that concrete support for faculty was given in less than half of the ID projects surveyed. Rewards for both planning and implementation stages came in the form of money or release time to work on projects. Only four project directors, however, could report with any certainty that they might receive consideration for promotion based on the time and effort spent on the project. Several PDs indicated that their work had seriously impaired their chances for promotion, and that their administration had encouraged them to stay away from development tasks in favor of further research. One such director admitted that he had been discouraged from such activity, despite the fact that he had been awarded the Distinguished Teacher Award by the institution's student body based on his innovative project. Such conflict among the traditional priorities of research, service, and teaching is by no means uncommon within other institutions. Changes in the promotion policies, giving all three areas equal weight, appear to be slow in coming. While administrators often actively promote the concept of better teaching, those groups who are in control of promotion standards seem uninformed of any shift in priorities towards the development of better instruction.

It is perhaps significant to note that a large percentage of the projects came from the community colleges, which are more strongly committed to providing instruction to a wide variety of learners than for individual faculty research. Two other four year colleges accounted for another sizable number of projects. In all these institutions, instruction seemed to be rated as equal in priority to faculty research. In one large university where such a priority does not exist, an enlightened administration bypassed the problem created by the recognized "second class status" of instructional development activity by employing only tenured professors to develop the large scale interdisciplinary program.

Part of the difficulty in giving administrative support to ID relates to the general role of the administrator in relation to the faculty. Many faculty perceive administrators as the adversary and fight to maintain as much control as possible over academic decision-making. An administration that appears too supportive of ID can be seen by

insecure faculty members as a threat to their academic freedom and integrity. Confrontation over management of instructional questions is not uncommon, particularly in older, more academically oriented, institutions where the individual freedom of the faculty member is sacrosanct. Several major projects involving several different subject-matter disciplines and consequent administrative approvals, failed because of either bitter polarization or total lack of communication between faculty and administrators concerning instructional goals.

At one institution, the staff of a major project charged that the administration had failed to take leadership because of a fear of arousing conflict, and thus, all central efforts for instructional improvement failed. The paradox here is that while administrators encourage improvement and even greater "productivity" among faculty, they tend to abdicate their power to allocate major resources and rewards, in favor of voluntary efforts at improvement by individual faculty members. While voluntary innovative projects are to be commended, such efforts are unlikely to produce major changes in the overall instructional practices on the campus. One director in a final plea to his administration for support stated that it alone "holds in its hands the symbols and prerogatives of legitimate authority. If it chooses to use that authority to improve instruction, change is possible . . . without that authority, the boundaries of voluntary innovation will prove impossible. . . ."

The same director was also critical of both faculty and administration for failing to recognize the intellectual depth of the instructional process. Gaps in knowledge, he claimed, were evident in areas of group dynamics, organization theory, experimental design, measurement, epistemology, statistics, instructional design, developmental and educational psychology, and details of particular technologies. To state that the missing knowledge is merely in the area of education, a field of little status and use, he charged, was an anti-intellectual defense.

A second institution is currently encountering a similar polarization and resistance with respect to a major campus-wide improvement grant. In the first institution the grant was finally terminated when it was evident that the administration could not and would not support the recommendations of the project directors. In the second, the administration has used its power through the grant as a political tool against an already embittered faculty. Developers caught in a power struggle have had little opportunity to effect major changes on a campus wide basis. In both cases the projects have been rendered ineffective by the lack of communication concerning methods for the achievement of common goals espoused by both sides.

It would appear at first glance that the size of the institution may have some effect upon the opportunity to achieve better communication. The larger the institution the more difficult successful communication becomes. In addition to size and communication systems, there are also the factors of the efficiency and the priorities of the institution's organization and management systems. Many successful projects surveyed were found in smaller institutions with supportive administrators who shared common goals with faculty. The small, voluntary, course-sized project, moreover, had a greater chance for survival than did those involving several faculty departments and more extensive program or budgetary needs.

Such interdisciplinary projects are only successful when supported by strong administrative initiative or backing. If, however, a number of different levels of administrative and faculty support or approval are necessary, the chances for success are reduced. As soon as major decision-making between potentially rival groups is involved, the opportunity for real change becomes dependent upon complex systems of internal communication and management. Too often these systems may be at cross purposes with a system for instructional improvement.

CONCLUSIONS

The overall low level of instructional development activity in the Delaware Valley/Philadelphia region was somewhat disheartening. The initial task of identifying qualifying ID projects was itself a difficult one. The fact that only one institution in the region, including those outside the survey, has an office and staff for instructional development, underscores the lack of serious concern for the improvement of instruction at the institutional level. This observation, however, should not be interpreted as a reflection of the success or failure of those projects reviewed in this survey, or of those committed faculty working on them. To the contrary, the survey illustrates that certain concerned faculty, dedicated to the improvement of instruction, will spend much energy and time on tasks which ultimately may not receive support from their peers or even from their administration. In fact, they persevere even though these ID tasks may damage their chances for promotion and their careers.

The single most apparent implementation strategy observed through the series of interviews with project directors, therefore, was not one present on the data sheet. It is a factor that is most difficult to measure quantitatively or even objectively. The power of a committed individual to do battle for change should never be underestimated. Lack of ID training, lack of experience, failure to evaluate all aspects of the project and even ignorance of all political and administrative hurdles can often be overcome by such commitment to a project goal. The

confidence and determination of knowledgeable professional academics stood out as an effective means of achieving legitimate improvement in instructional practices.

While such commitment is essential, strong independent personalities alone cannot bring about the full range of improvement needed by most institutions. Often when cast in the role of rebel, such individuals can become isolated or defensive about their own individual projects. For too long institutions of higher education have stressed the independence of individual academic roles. If instruction is to be significantly improved across the spectrum of college level education, then expertise is needed in many areas. Our institutions train graduates in interpersonal communication, in organization, in administration, in learning and instruction. It is time that these skills were used within the structure of the university community to effect the improvement of its own internal systems. Instructional development systems cannot be totally successful without parallel study and development of the institution's communication and management systems.

It is also apparent from this survey that the role of the professional instructional developer is one of support for the academic project director rather than one of leadership. To give too much power to a change agent appears to threaten both faculty and administration. To illustrate this supportive, facilitative role, one can note the change of strategy that our foreign service change agents have adopted in the last few years. Programs like Action no longer march confidently into underdeveloped countries complete with all of the answers. While these agents are prepared with the latest medical agricultural technologies, they no longer set up the programs paternalistically for the native populations. The new approach is to begin to interact at a more personal level with people in the target areas in order to begin the definition of problems and the discovery of workable solutions. Both sides contribute not only to "the project", but also to sharing and interpersonal growth. This more humane, and ultimately more successful, approach allows the partners to exchange new ideas and technologies in the implementation of new programs. As programs begin to be implemented with advice from the change agents, the role of the agents begins to diminish as the learners acquire the skills to incorporate the innovations into their own daily routines. Rogers and Shoemaker (1971, p. 235) document this shift in the role of the change agent, using research on innovation which they have reviewed. Professional instructional developers have much to offer regular academic faculty, but their ability to utilize interpersonal communication skills as well as social and political organizational skills are just as valuable to their success as are their abilities with instructional systems.

Perhaps the single most valuable tool the ID professional can bring to the faculty member is the technique of program documentation. Without the documentation of the ID process from its initial planning through the evaluation and revision of the system, the faculty developer cannot hope to remove the stigma of second class status which the academic community attributes to the developer. The technology involved in the ID process (when done according to its step by step procedures, including learner and content analysis, specification of learner performance goals, development of evaluation measures, design of instructional strategies and resources, testing of procedures, learner and program evaluation) is a rigorous exercise that can be documented in every phase. Such data can provide faculty with specific evidence to demonstrate the effectiveness of their programs to both their administrators and to their peers. Such information provides the basis for a growing body of research into learning strategies. Published or unpublished, the amount of effort expended in writing proposals, completing development tasks, and collecting and evaluating documentation is as measurable as is that expended in traditional research efforts by other faculty. Such documentation of ID projects can thus be used as evidence of scholarship in the consideration of faculty members' promotions.

In summary, the implementation of instructional development technologies for the improvement of education requires the skills of committed agents possessing proficiences in instructional systems, in interpersonal communication systems, and in organizational systems. Such change agents can assist faculty not only in building their own skills in instructional improvement, but also in documenting their work, thereby helping them to receive the appropriate recognition that they deserve from the academic community.

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CHAPTER X

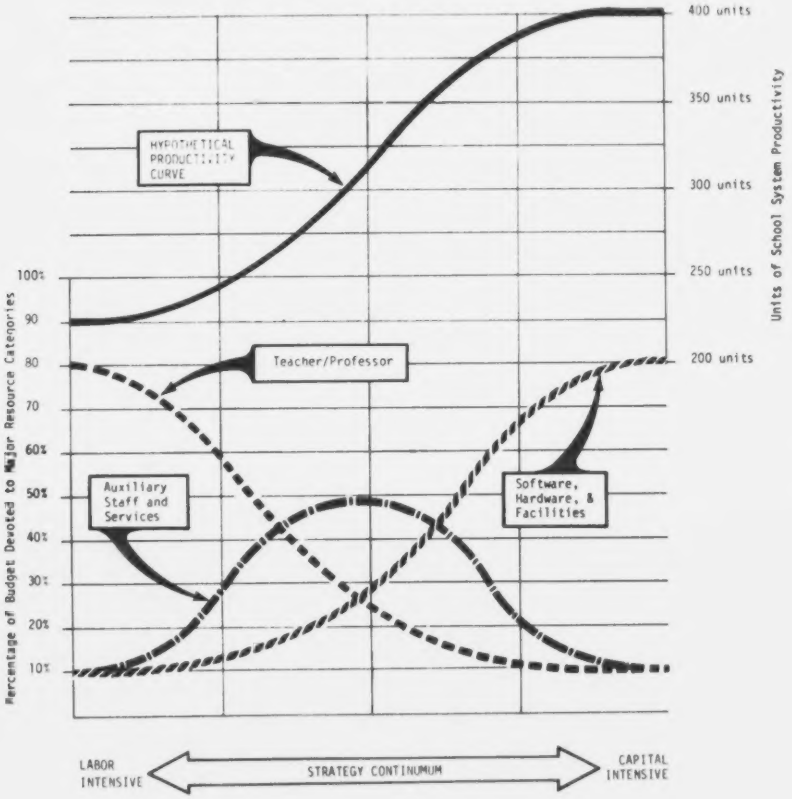
ECONOMIC EVALUATION IN/OF INSTRUCTIONAL DEVELOPMENT

By

Gene L. Wilkinson

It does not take an extensive presentation to convince educators that they are in the midst of a crisis involving educational cost and effectiveness. The newspapers are full of reports of the failure of school bond issues, of the reluctance of legislatures to fund university budget increases, of falling SAT scores, and of law suits which charge malpractice when school graduates are unable to read and write. Many groups and individuals have suggested that technology, both as machine and as technique, might contribute positively to the solution of the problem of rising costs combined with falling productivity (Carnegie Commission, 1972; Commission on Instructional Technology, 1970; Committee for Economic Development, 1968; Scanlon, 1973). One suggestion is to transform the present labor intensive educational system into one which is capital intensive. The possible effect of such a change is illustrated in Figure 1 (adapted from Wilkinson, 1972). Presently schools are devoting a high percentage of their total budgets to salaries. If this emphasis were to be shifted so that a higher percentage of current budgets were allocated to either auxiliary staff and services or instructional software, hardware, and facilities, there should be an increase in the total productivity of the school system. Such an increase, however, must be considered hypothetically because there is little factual knowledge about the productivity of educational media or about the cost and effectiveness of instructional development (Wilkinson, 1973). Caffarella (1975), in an examination of over 300 references dealing with the cost-effectiveness of educational media, found only 32 which were based on empirical data. Lee (1972) found that instructional development programs in institutions of higher education did not employ strategies designed to evaluate cost-effectiveness. A conference dealing with the implementation of instructional development through learning resource programs found that one of the major problems facing such programs is economic; specifically, that of insuring the cost-effectiveness of their instructional development programs (Halloway, 1974).

Figure 1. Effect of Changing Strategies of Productivity



OBJECTIONS TO ECONOMIC EVALUATION

The lack of valid economic evaluations of the effectiveness of instructional development can be blamed on a number of factors. Questions of instructional cost-effectiveness are considered to be somewhat illegitimate by academicians (Newman, 1971). Administrators are under too great a pressure to produce immediate improvements to be concerned with the long-range evaluation necessary to demonstrate cost-effectiveness (Temkin, 1974). The effort to gain accurate cost information is itself a large cost item (Belmore, 1972). The major problem inhibiting the application of economic evaluation strategies within education, however, is a lack of understanding of the approach and of the concepts upon which it is based (Kaufman and Cohn, 1972). Some of these misconceptions should be examined in detail before we move into a general discussion of the potential relationship of economic evaluation strategies to the instructional development process.

COST EVALUATION BOILS DOWN TO "PICK THE CHEAPEST WAY TO DO IT"

The aim of cost evaluation strategies is not to pick the "cheapest" alternative but rather to pick the most economical. This requires that the objectives or outputs to be obtained must be clearly and fully defined. With the output defined, it should be possible to determine the approach which provides either the most output for a set cost or which provides a set level of output for the least cost — this being the definition of economic efficiency. The concern in economic evaluation is the balance of cost and effectiveness, not just the cost.

BECAUSE OF ALL THE COMPARATIVE MEDIA STUDIES WHICH SHOW CONFLICTING RESULTS OR NO-SIGNIFICANT-DIFFERENCE, THIS STILL MEANS "PICK THE CHEAPEST"

It might be reasonable to say that since there is no-significant-difference in student performance between students who listened to a lecture and students who viewed a mediated presentation, educational efficiency can be improved by simply increasing the number of students enrolled in a particular class or section. However, there is reason to doubt the validity of the comparative media studies. For example, Hartley (1966) examined 112 studies which compared programmed instruction to conventional instruction. When he had eliminated those studies which did not meet minimal requirements for comparative studies, he was left with only six valid studies; these studies not only showed significant differences but tended to support each other. In many of the studies comparing film or television with conventional instruction, the measure of effectiveness was performance on standardized tests. As Popham (1973) points out, such tests are designed to

reduce the effects of different instructional strategies. Also, few of the studies made any attempt to identify interactions between treatments and student characteristics. The area of comparative media studies is still open and needs to be re-examined by educational researchers.

ECONOMIC EVALUATION TAKES THE DECISION-MAKING PROCESS OUT OF THE HANDS OF THE RESPONSIBLE ADMINISTRATOR AND TURNS IT OVER TO A TECHNICIAN

The analyst does not make decisions. He works within parameters set up by the developer and decision maker. He merely provides information to the decision maker. Since so many aspects of educational cost have not been adequately defined, since many of the desired outcomes of education cannot be quantified, and since so many political factors must be taken into consideration in making educational decisions, there is a high degree of uncertainty in the economic evaluation of educational alternatives. At best these evaluation strategies provide a basis for comparing alternatives, thereby making explicit the currently intuitive decision-making process.

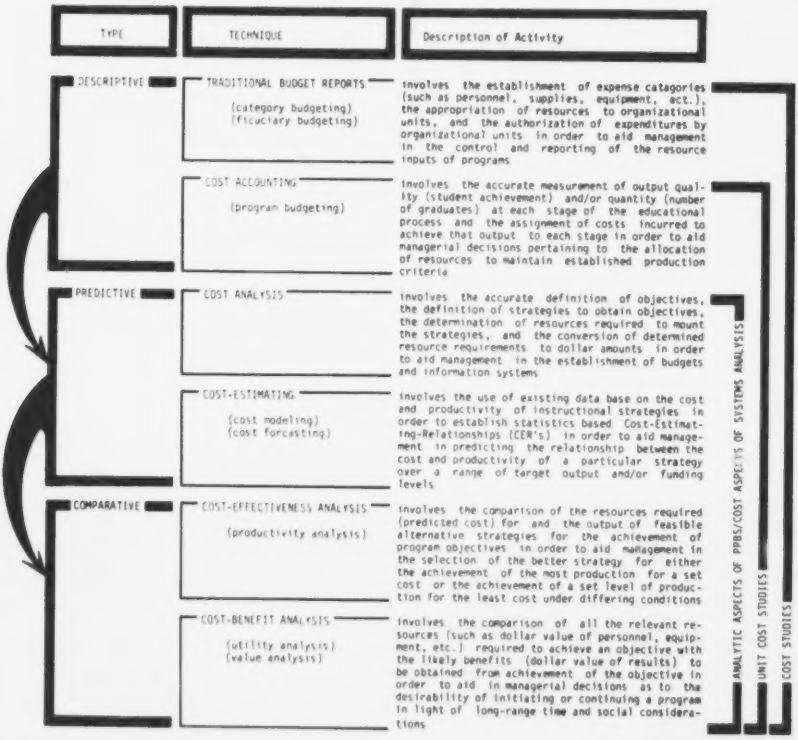
THERE ARE SO MANY DIFFERENT TERMS AND TECHNIQUES THAT IT ISN'T POSSIBLE TO KEEP TRACK OF THEM, LET ALONE USE THEM PROPERLY

To many, this would seem to be a valid objection. Terms such as cost-effectiveness, cost analysis, cost estimating, cost-benefit, utility analysis and cost modeling are often used interchangeably and improperly (McCullough, 1966). Many studies in education which claim to be cost-effectiveness reports are in fact reports of cost and effectiveness. When used with proper precision, however, the various costing terms point out some useful distinctions in terms of intents, techniques, and points of application.

INTENT OF TECHNIQUE

In order to clarify some of the differences among the different costing techniques which are available for use by the instructional developer, a system is presented in Figure 2 which classifies and interrelates most of the terminology currently being used to describe aspects of economic evaluation (adapted from Wilkinson, 1972, 1973). The various costing techniques can be divided into three broad categories on the basis of the intent of the analysis: descriptive, predictive, or comparative.

Figure 2. Classification System for Costing Techniques


TYPE
TECHNIQUE
Description of Activity
DESCRIPTIVE
TRADITIONAL BUDGET REPORTS
(category budgeting)
(fiduciary budgeting)
involves the establishment of expense catagories (such as personnel, supplies, equipment, act.); the appropriation of resources to organizational units, and the authorization of expenditures by organizational units in order to aid management in the control and reporting of the resource inputs of programs
COST ACCOUNTING
(program budgeting)
involves the accurate measurement of output quality (student achievement) and/or quantity (number of graduates) at each stage of the educational process and the assignment of costs incurred to achieve that output to each stage in order to aid managerial decisions pertaining to the allocation of resources to maintain established production criteria
PREDICTIVE
COST ANALYSIS
involves the accurate definition of objectives, the definition of strategies to obtain objectives, the determination of resources required to mount the strategies, and the conversion of determined resource requirements to dollar amounts in order to aid management in the establishment of budgets and information systems
COST-ESTIMATING
(cost modeling)
(cost forcasting)
involves the use of existing data base on the cost and productivity of instructional strategies in order to establish statistics based Cost-Estimating-Relationships (CER's) in order to aid management in predicting the relationship between the cost and productivity of a particular strategy over a range of target output and/or funding levels
COMPARATIVE
COST-EFFECTIVENESS ANALYSIS
(productivity analysis)
involves the comparison of the resources required (predicted cost) for and the output of feasible alternative strategies for the achievement of program objectives in order to aid management in the selection of the better strategy for either the achievement of the most production for a set cost or the achievement of a set level of production for the least cost under differing conditions
COST-BENEFIT ANALYSIS
(utility analysis)
(value analysis)
involves the comparison of all the relevant resources (such as dollar value of personnel, equipment, etc.) required to achieve an objective with the likely benefits (dollar value of results) to be obtained from achievement of the objective in order to aid in managerial decisions as to the desirability of initiating or continuing a program in light of long-range time and social considerations
ANALYTIC ASPECTS OF PPBS/COST ASPECTS OF SYSTEMS ANALYSIS
UNIT COST STUDIES
COST STUDIES

BEST COPY AVAILABLE

DESCRIPTIVE STUDIES

Descriptive cost studies are the essential first step in developing a sound basis for determining the economic viability of instructional technology and of instructional development. Such studies seek to describe the costs of existing projects or programs. A distinction is made in this category between traditional budgeting and cost accounting.

Traditional budgeting lumps all expenses into such categories as salaries and wages, supplies and expenses, capital and travel. These categories are subdivided horizontally on the lowest administrative unit level but there is normally no attempt to allocate expenses on the course or project level where the outputs of the educational system are generated. Such budgets can allow cost comparisons between departments, programs, or schools and are useful in insuring the legal authorization and control of expenditures, but they tell us little about the "true" cost of instructional technology and often hide more information than they provide.

Cost accounting or program budgeting techniques seek to allocate cost items to the program elements that generate measurable output units. Under such a system, a single professor's salary might be split so that portions are applied to several different courses, research projects, or public service activities. Educational cost accounting systems can be quite complex. Wilkinson (1971), in developing a program budget system for a large university media program, was able to identify 117 separate output generating elements without conducting the analysis on the level of individual courses or projects. This complexity is why so few universities utilize more than a very simple program budget format. Most often there is only an attempt to analyze costs into such broad areas as instruction, research, and public service.

PREDICTIVE STUDIES

The second category of cost studies are those which seek to predict the costs of proposed systems. There are two major categories of predictive studies – cost analysis, which identifies the resources needed by and, therefore, the costs of a pre-defined system that operates at a set level of effectiveness, and cost-estimating, which employs statistical regression techniques with existing cost data in order to predict a range of costs over a number of output levels for a particular strategy. Although there are some major differences between the two types of predictive studies which will be discussed in detail in a later section, they share some common characteristics. Both techniques involve the accurate definition of objectives and the design of systems which will achieve these objectives.

COMPARATIVE STUDIES

The final category of cost studies are those which seek to compare alternatives in a systematic manner. These comparative studies are based on the predictive studies which, in turn, are based upon the descriptive studies. Within this category, a distinction is made between cost-effectiveness studies, which compare alternative ways of achieving a particular objective, and cost-benefit studies, which compare the costs of achieving alternative objectives against the benefits to be obtained from achieving these objectives.

Such comparisons are not as complex as the economic terminology employed in them often leads us to assume. We are constantly using these techniques on an intuitive basis. When an individual goes to a professional convention and decides to sit in on one of the presentations, he is making an intuitively based cost-benefit decision. The value to be obtained from listening to the speaker is greater than the value that could be obtained from other ways in which he could be spending his time, such as attending some other presentation, viewing the exhibits, or sharing a cup of coffee with a friend. In the same situation, if it were essential that the individual obtain the information that the speaker was going to present, but he had the option of either picking up a copy of the formal paper or listening to the verbal presentation, he is faced with a cost-effectiveness decision. Which of the available means of achieving the objective of gaining the information costs the least in terms of time, energy, or expense? The obvious choice in such a situation would be to pick up a copy of the paper. However, there is often much to be gained from the informal interchange between the speaker and his audience in such presentations. If this is part of the objective to be achieved, it needs to be stated as a part of the objective. The careful statement of objectives is one of the key points in performing any economic evaluation. The next section will look at this and other points in more detail.

TECHNIQUES OF COST-EFFECTIVENESS EVALUATION

Cost-effectiveness analysis is used to evaluate, and choose between, alternative means of achieving a specific objective. Such an analysis can proceed from either of two orientations – the achievement of an established output level for the least cost or the achievement of the most output for a set level of cost. No matter which approach is employed, there are a number of fundamental operations which need to be carried out in any properly designed cost-effectiveness evaluation: (1) determination of objectives, (2) determination of viable alternatives, (3) determination of relevant costs, and (4) presentation and interpretation of results. The first two of these operations are most properly the domain

of the instructional developer, rather than that of the cost analyst. However, there are some requirements which these two operations must meet if the economic evaluation is to be valid. It is necessary, therefore, to look briefly at these operations before turning to the determination and presentation of the cost data, which is the prime concern of the cost analyst.

DETERMINATION OF OBJECTIVES

The first step in any cost-effectiveness evaluation is the definition of the objectives that are to be achieved by the alternatives to be considered. The statement of objectives should include the following: (1) the outputs to be obtained from the system, (2) the inputs available to the system, and (3) the units by which both outputs and inputs are to be measured. The statement of objectives should not include anything, such as the specification of presentation formats, which might limit the total number of options which might be included in the analysis.

The major problem with cost-effectiveness analysis in instructional development activities is the selection of the output measures. Most studies that have been conducted have employed economic measures — such as number of graduates, number of student-contact-hours, or student-credit-hours — rather than measures of educational effectiveness. This is largely the result of assuming that there are no significant differences among students' performances which are attributable to differences in presentation strategy. Also, there is difficulty in relating measures of cognitive and non-cognitive behavioral change to changes in system input levels for the purpose of comparison. When the differences in learning or affective behavior for individual students are used in the evaluation, variations in total output levels are derived by the combination of such behavioral measures with some economic output indicator, e.g., number of students X average score on a standardized examination. Such measures should become more common as the methodology of educational cost-effectiveness evaluation is developed. For example, Segal (1976) has reported on a current study of CAI which uses marginal annual costs per achievement gain per child as the objective measure.

DETERMINATION OF VIABLE ALTERNATIVES

The second step in a cost-effectiveness evaluation is the determination of alternative instructional strategies which could be employed to achieve the objectives and which, therefore, will be compared in the study. At first, the designer would want to consider the total universe of possibilities — limited only by his knowledge and imagination. But this universe of possibilities is rapidly reduced through consideration of those constraints which serve to limit his options when dealing with

real-world problems. Some of the constraints which serve to limit the available options are as follows (adapted from Judy, 1969):

IMAGINARY CONSTRAINTS: limits imposed by the inability or unwillingness of individuals to consider alternatives which are outside of their realm of experience;

TECHNOLOGICAL CONSTRAINTS: limits imposed by a consideration of what current technology can achieve;

POLICY CONSTRAINTS: limits imposed by decisions made at other levels in the organization;

POLITICAL CONSTRAINTS: limits imposed, or thought to be imposed, by the larger public;

ORGANIZATIONAL/LEGAL CONSTRAINTS: limits imposed by the division of power, rights, and responsibilities among various bodies;

RESOURCE CONSTRAINTS: limits imposed by unavailability of one or more of the resources required for certain alternatives;

TARGET CONSTRAINTS: limits imposed by a commitment to achieve a particular goal or level of effectiveness.

An explicit listing of presentation requirements is developed through a consideration of the constraints. The alternatives that meet the criteria of the statement of presentation requirements would be the "viable" alternatives which would be evaluated in the analysis.

In many cases, one of the constraints under which we operate is the prior choice of one of the media alternatives to be evaluated – for example, CAI. However, to say that CAI is to be one of the alternatives is not enough. CAI is a fairly broad term which can mean a large number of things – in terms both of the software that is to be displayed and the hardware configurations upon which the display is to be presented. There are at least ten major variations of computer-based delivery systems – ranging from a basic minimum specified by the definition of CAI (a form of individualized instruction that employs digital computer technology to manage and display information, accept student responses, provide knowledge of results, and select subsequent learning events), through variations of the PLATO IV and TICCIT systems, Computer Managed Instruction, and computer simulation/gaming configurations (Wilkinson, 1976). If CAI is to be one of the alternatives, the form and format of its configuration must be clearly specified.

The need for clear definition of the CAI configuration is even more important when it comes to determining the alternatives against which it is to be compared. The comparison is to be with "viable" alternatives. What are viable alternatives to CAI? This would be determined by both the project objectives and the constraints under which the project is operating. If the project calls primarily for rote drill and practice,

an alternative could be a linear programmed text or a simple workbook. In this case, CAI would probably be a poor choice from a cost-effectiveness point of view. However, if the project called for taking advantage of the flexibility, memory capacity, and fast response capabilities of the computer in order to produce "infinitely" branching programs providing individually shaped, corrected, and reinforced programs taking into consideration the needs, knowledge, and prejudices of each learner, clearly alternatives other than workbooks need to be considered. Traditional instruction – the self-contained classroom using one teacher with 20–25 students, and using various textbooks and aids – does not provide this sort of flexibility and, therefore, should not be one of the alternatives considered. Possibly a tutor, working on a one-to-one basis (provided that this tutor has the same grasp of the subject field and the various ways in which it can be misunderstood and mastered as does the team of design and subject specialists who developed the CAI program) would be able to provide such an alternative. Another possible alternative would be Individually Prescribed Instruction.

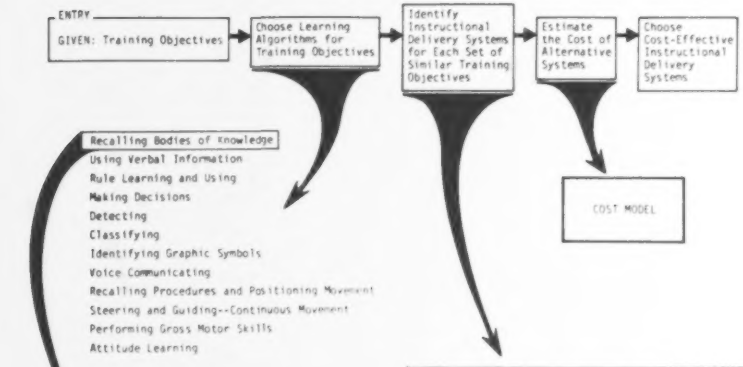
A number of systematic procedures for identifying the comparable viable alternatives have been developed for use in the design of military training systems (Hess, 1975; Braby, 1975). Figure 3 presents an overview of the system developed for the Navy by Braby, *et al.* Starting with the training objectives, the analyst/designer selects the appropriate algorithm (type of learning) called for by each objective. For each of the 12 algorithms, a selection matrix which identifies the stimulus characteristics of media systems appropriate to the algorithm has been developed. Figure 3 presents the matrix for the "recalling bodies of knowledge" algorithm. The analyst marks the criteria which must be met in the appropriate column and checks the rows to determine which of the alternate delivery systems will be considered in the analysis. The procedure then calls for the analyst to feed such information as number of students, sections, time required, etc., into a computer-based cost model which computes costs for each of the alternatives being considered. Other methods of computing system costs will be considered in the following section.

DETERMINATION AND PRESENTATION OF RELEVANT COSTS

Once the alternatives to be compared have been listed, it is necessary to establish the relative cost and productivity of each. Two different techniques can be employed: cost analysis and cost-estimating.

Cost analysis can proceed from one of two approaches, fixed-effectiveness or fixed-cost. In the fixed-effectiveness approach, a target level of effectiveness is established. Those systems are defined which would employ each of the alternatives under consideration and which

Figure 3. Cost-Effectiveness Media Selection Procedure



To choose a delivery system:

1. Place a "✓" in boxes representing criteria that must be met.
2. Select the delivery systems that have an "X" in each row that is designated by a "✓".

Criteria for Selecting Instructional Delivery Systems		Alternative Instructional Delivery Systems: Delivery Approaches Permitting the Application of ALL Learning Guidelines and Algorithm					Delivery Approaches NOT Permitting Complete Application of Learning Guidelines and Algorithm			
		CAI	Teaching Machine--Branching	Microfiche with Self-Scoring Tests	Programmed Text--Branching with Self-Scoring Tests	Audio Visual Carrel with Program Texts, AV Modules and Self-Scoring Tests	Traditional Classroom with Instructor, Overhead Projector Texts, and Paper & Pencil Tests	Independent Study Using Textbooks, Handbooks, Tests, and Workbooks	Instructional Television Broadcasts or CCTV without Feedback, Tests	Programmed Text--Linear with Instructor Scored Criterion Test
Stimulus Criteria	• Visual Movement: Limited	X	X			X			X	
	Full	X				X			X	
	• Visual Spectrum: Full Color	X	X	X		X	X	X	X	
	• Audio: Voice Sound Range	X	X			X	X		X	
	Full Sound Range					X				
Training Setting Criteria	• Individual Trainees at Fixed Location	X	X	X	X	X	X		X	X
	• Individual Trainees with Simultaneous Instruction in Many Locations								X	
	• Individual Trainees with Independent Instruction at Any Location			X	X			X		X
	• Small Group						X		X	
	• Large Group at a Single Location						X		X	
	• Team Setting									
Administrative Criteria	• Site of Development: Local			X	X	X	X	X		X
	Central	X	X	X	X	X		X	X	X
	• Magnitude of Acquisition Cost: Low			X	X		X	X		X
	High	X	X			X			X	

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would produce at the established level of effectiveness. The resources, such as personnel and equipment, which would be needed to develop and maintain each system are then determined and converted to dollar costs at the current market price, producing a total dollar cost for each alternative. The problem of choice then becomes one of selecting the least expensive alternative. The fixed-cost approach on the other hand, requires the analyst to determine, for a set level of funding, the productivity of different systems, each of which employs one of the alternatives under consideration. The problem of choice under this approach is to select the most productive alternative. Presentation of the results of the evaluation is relatively simple when cost-analysis techniques are employed — a one page summary of the results would be more than adequate.

The determination of the cost estimate through cost analysis can become a highly complex cost accounting task. This complexity can be appreciated by examining the cost model for instructional television presented in Figure 4 (adapted from Walter, 1969). The major problem with cost analysis estimates is that the estimate produced is a single-point figure rather than a continuous function over variations in output. The output of the alternatives that are being evaluated would probably not vary linearly over different rates of input. This would lead to different orders of preference among them at different levels of funding. Therefore a new estimate must be made if the projected funding level is changed or if a different level of output is selected.

Cost-estimating seeks to avoid the major problem of cost analysis by establishing a continuous prediction function for each alternative over a range of possible output levels. These prediction functions are termed Cost-Estimating-Relationships (CERs). The CERs are derived by means of standard procedures of regression analysis applied to historical data from systems similar to the alternatives under consideration. As illustrated in Part A of Figure 5, existing data on the cost and productivity of similar systems are plotted on a scattergram and the line of best fit is determined. Assuming that the assumptions necessary to employ regression analysis have been met, the line of best fit produces a continuous curve displaying the predicted values of input or system cost over the range of possible system output levels. Similar CERs are then developed for the other alternatives under consideration.

The balance sheet approach to the presentation of the results that was employed with the cost analysis approach to cost-effectiveness evaluation is not feasible when cost-estimating relationships are used. The continuous nature of such projections cannot be readily conveyed through raw figures. With such projections, a graphic decision model,

Figure 4. Cost Prediction Model for Instructional Television

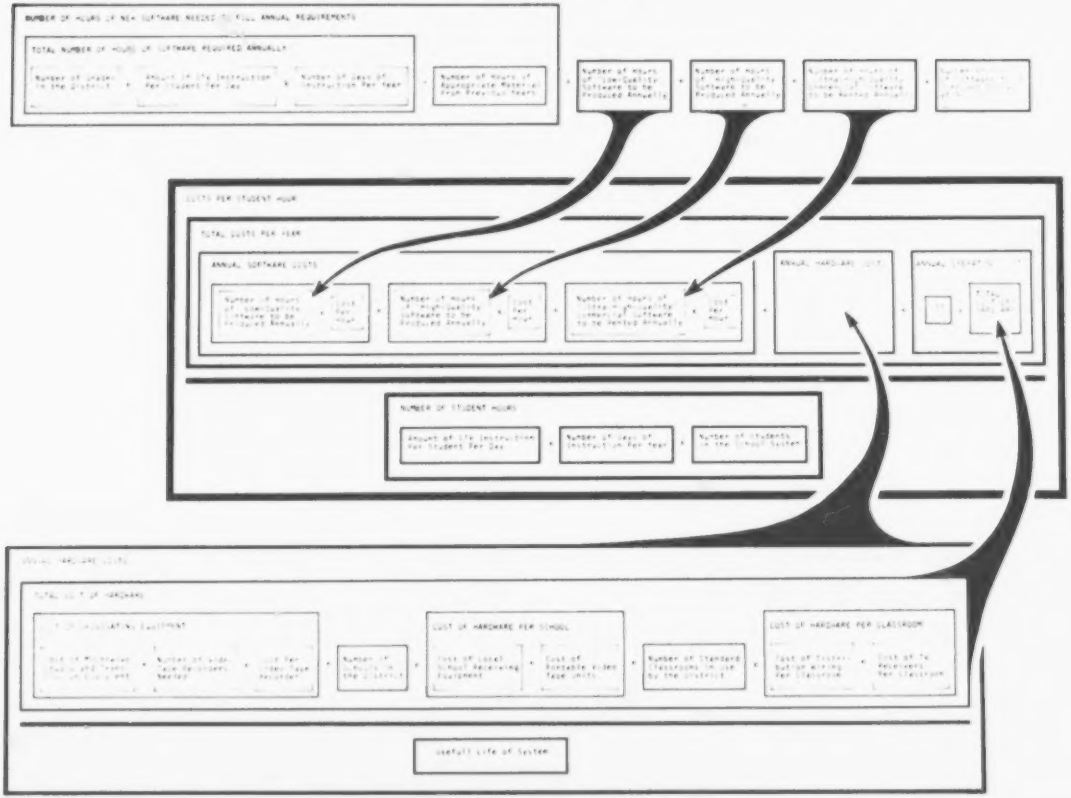

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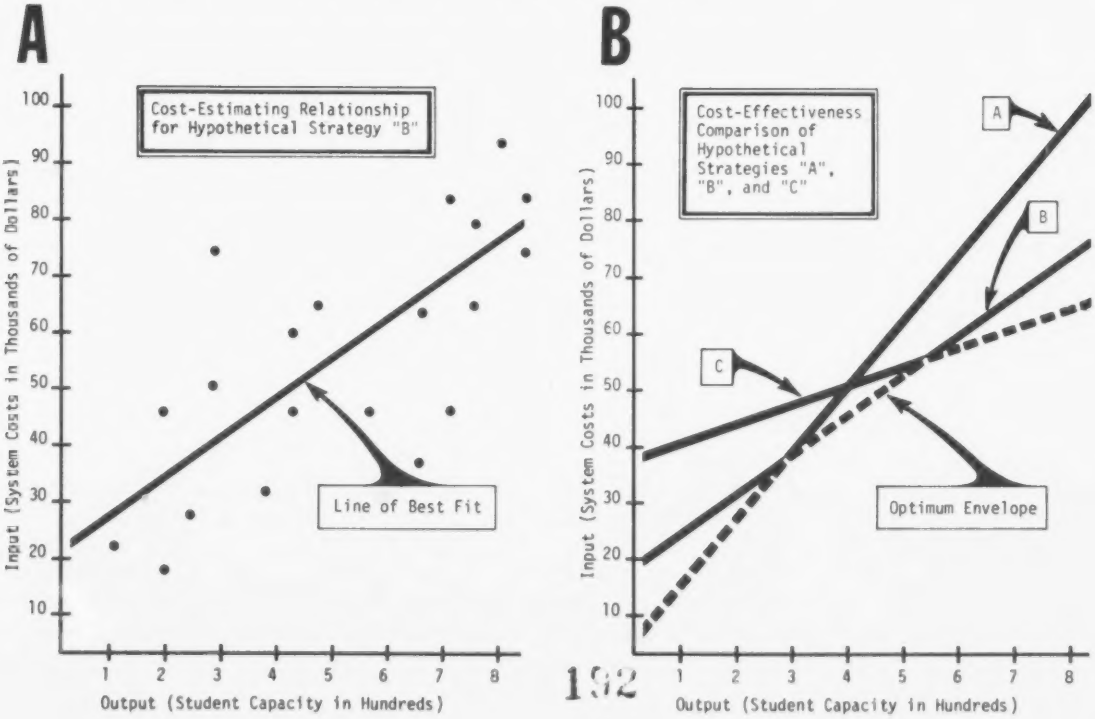
Figure 5. Determination and Presentation of Cost-Estimating Relationships

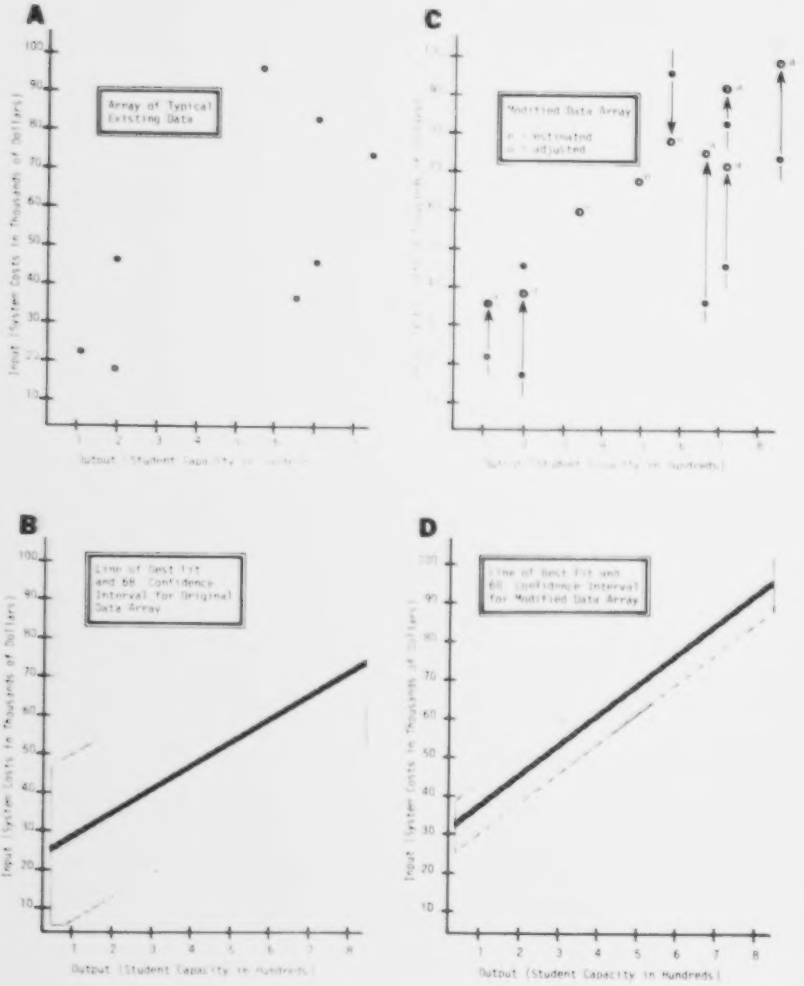


such as the one shown in Part A of Figure 5 should be prepared. The CERs for the three different alternatives which are being evaluated are shown as lines "A", "B", and "C" on the model. Using these functions, it is possible to draw an envelope of optimum choice (shown as a broken line in Figure 5B) which identifies the "best" choice of strategies for any level of desired output or at any level of available funding. In this example, alternative "A" would be the better choice for any system with a capacity of less than 300 students or for any budget under $35,000. For a system with a capacity of from 300 to 550 students, alternative "B" is the better choice. Alternative "C" is the better choice for any system with a capacity of over 550 students or for a budget of over $55,000. The effects of using cost analysis to evaluate these alternatives can be seen by examining the data presented in Figure 5A. If a fixed-effectiveness approach, with a target level of 700 students, had been selected, the alternatives would have rated "C" first with "B" and "A" following in that order. If a fixed-cost approach, with a set budget of no more than $45,000, had been selected, the order of preference among the alternatives would have been "B" first followed by "A" and then "C".

The use of cost-estimating-relationships has a number of advantages over the use of cost analysis techniques. A number of problems, however, are associated with their use. Often, for example, the line of best fit which can be derived from the historical data is curved rather than straight which calls for the use of complex curve-fitting techniques. In a strategy which has a large capital investment for implementation, but for which there is only minor increments in cost per student as the capacity of each major component is approached, the CER is more likely to take the form of stair steps with sloping platforms. Other difficulties arise with respect to the data base from which the estimates are derived. The information may be in the wrong format (requiring, for example, the conversion of existing output data from student contact hours to number of graduates) or the cost categories employed in the various historical studies may vary (requiring an examination of the detailed cost figures as well as the total system cost) and very likely the data were generated at different points in time (requiring, at least, adjustments for inflation or other changes in the market value of resources). Such problems greatly increase the difficulties encountered by the analyst and affect the reliability of the values calculated through the use of CERs.

The problems caused by inadequate or missing data when using CERs is illustrated in part B of Figure 6. Using the data presented in Figure 6A, the standard error of estimate was determined and a 68% confidence interval (gray area in Figure 6B) was plotted on the line of best fit. If such confidence intervals were plotted on the decision model

Figure 6. Determination and Improvement of Confidence in CERs


A
Array of Typical Existing Data
C
Modified Data Array
B
Line of Best Fit and 68 Confidence Interval for Original Data Array
D
Line of Best Fit and 68 Confidence Interval for Modified Data Array
Input (System Costs in Thousands of Dollars)
Output (Student Capacity in Hundreds)

presented in Figure 5B, the decision-maker would be faced with a situation where no one alternative was clearly the "best" choice at any level of cost or of output. This problem can be reduced both through the estimation of costs to fill gaps and through adjustment to the existing data base. The effects of such an adjustment to the data presented in 6A is illustrated in Parts C and D of Figure 6. However, as can be seen from this example, cost-effectiveness evaluations must always be viewed as aids to decision-making rather than as a decision-maker themselves.

TECHNIQUES OF COST-BENEFIT EVALUATION

The second major type of comparative cost study, cost-benefit analysis, is concerned with the comparison of the costs of various alternatives with the benefits to be obtained from them. In the business world, such information is provided by profit-and-loss statements. In education and other areas of governmental activity, however, a substitute for the profit/loss approach must be found. That substitute is cost-benefit evaluation.

In its pure form, such an evaluation requires that the output from each of the alternatives being compared be given a dollar value, thereby ensuring that both benefits and costs are being measured in the same units. In some cases, this is a fairly simple process. The differences in lifetime earning capacity between a college graduate and a high school dropout can be easily obtained from government statistics. When less quantifiable objectives such as appreciations or attitudes are incorporated, or when the impact of a particular project on an individual is hard to differentiate from the effects of other experiences to which he is also subjected, the problem becomes much more complex and subjective. Given solutions to these problems, the cost-benefit decision process becomes one of selecting the alternative with the highest ratio of benefits to costs using the following formula (adapted from Kaufman, 1972):

$$\sum^{T} b_t \quad (1 + r_b)^{-t} \quad / \quad \sum^{T} c_t \quad (1 + r_c)^{-t}$$

Where: T = life of project in years

b_t = annual benefits

c_t = annual costs

r = rate of discount

t = one year

The use of a discount rate in the formula is an acknowledgement of the idea that it is better to receive immediate benefits than to receive a

possibly greater benefit in the future. Basically, it is equivalent to an interest rate that might be earned by placing the money expended on the project on deposit with a bank. The use of such discount rates can have a major effect on the decision to be made using cost-benefit analysis. A study of Korean education found that the rate of return from a middle school education was greater than the rate of return from either high school or college graduation, in spite of a greater lifetime earning capacity for the rejected alternatives (Kraft, 1972).

Since discounting is not normally employed in educational institutions, it is possible to employ some simplified cost-benefit methods within the instructional development process. Figure 7 illustrates the conversion of the cost-effectiveness decision model presented in Figure 5B to a cost-benefit decision model. Part A of the figure presents the value of the resources required for each of the strategies (costs of the alternative systems) and the value of the benefits to be obtained from the adoption of any one of the alternatives at any level of output. Since each of the system prediction functions can be considered a fixed-effectiveness projection (i.e., each system is capable of producing at all levels of output), a single line will suffice to plot the benefits to be derived from adopting any of the systems. In other words, the benefits, for any level of output, is constant over alternatives. The value of this line is determined by computing such factors as the increased earning capacity of each graduate from the system, increasing the value proportionately as the number of graduates increases. (In order to keep the example simple, we are ignoring the probability that the average earning capacity of graduates might bear an inverse relationship to the number of graduates produced, due either to a shortage or to an oversupply of individuals with the same employment skills.) Once the value of each of the training systems has been determined, it is a simple subtraction problem to determine the social worth of each individual alternative; the worth is equal to the value minus the cost.

A cost-benefit decision model for the example is shown in Part B of Figure 7. The base line of student capacity is now at the midpoint of the model, with positive worth of the systems above the line and negative worth below the line. New prediction functions for each of the alternatives have been derived from it. It is now possible to see that for each of the alternatives there is a negative worth for some level of productivity or output. At some point each costs more than there is to gain. If a system with a capacity of over 200 students is not planned, there is no "good" choice among the alternatives as considered, as all systems have a negative worth below this point; alternative "C" does not even reach the break-even point until over 600 students are being handled. This conversion to a cost-benefit model brings about a reordering and shifting of the alternatives and results in a new envelope

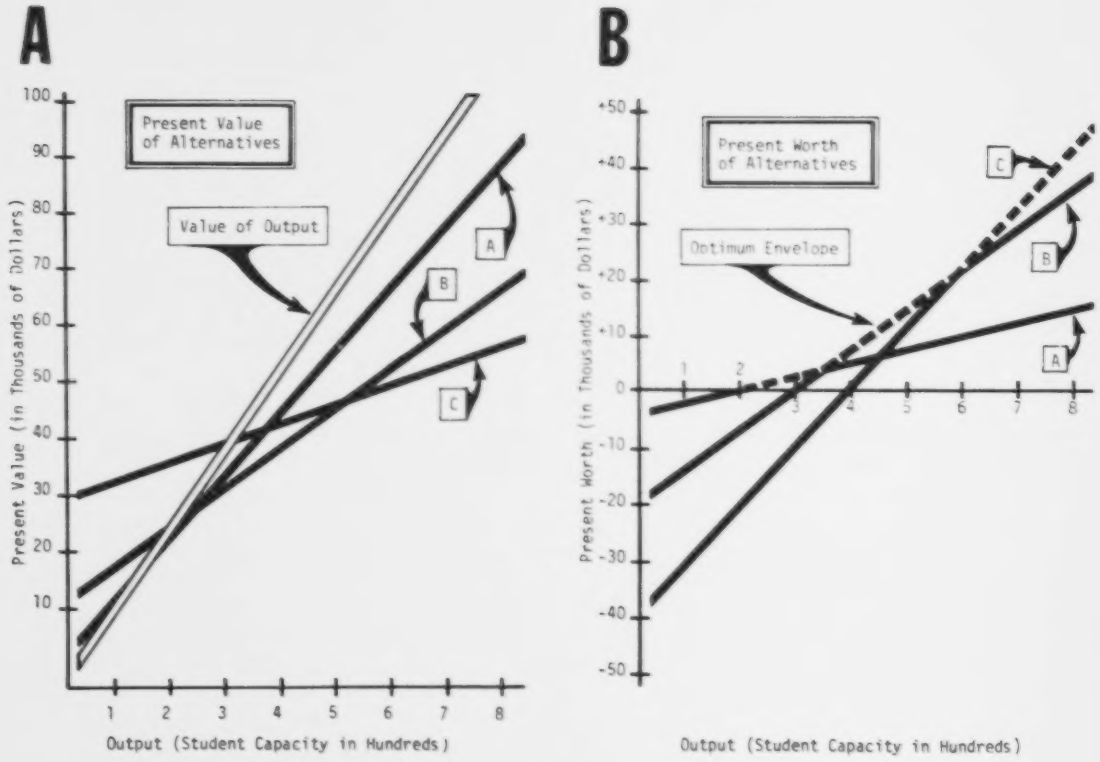


Figure 7. Determination and Presentation of a Cost-Benefit Model

of optimum choice which is shown as a broken line in the figure.

With a basic understanding of some of the available economic evaluation tools, it is now possible to turn to questions of when and where the various techniques could or should be employed.

PRACTICAL CONSIDERATIONS

Up to this point, the concern has been primarily with the theoretical aspects of economic evaluation. It is now time to consider some of the more immediate practical aspects which are of concern to the instructional developer. Such problems as selecting the appropriate evaluation technique, determining effective vs. true costs, developing the data base, and simplifying the available techniques need to be examined.

SELECTION OF APPROPRIATE EVALUATION TECHNIQUES

Different techniques of economic evaluation are appropriate to different types of questions and to different levels of the educational system (Pearson, 1973). Figure 8 illustrates some of the major differences in the point of application and therefore in the types of questions and evaluation techniques that would be appropriate for use by the instructional developer. Analysis can be conducted at the individual and at the societal levels; however, in the present context we are concerned with applications within formal education at either the institutional/school level, the departmental/unit level, or the project/team level. At the school or institutional level the types of questions which are most often asked concern whether the institution would get more from establishing an instructional development unit, from expanding the inservice education program, from establishing some special education programs, or from some other activity. This situation calls for a cost-benefit decision. At the level of the instructional development unit, when the decision is made as to which project to develop, cost-benefit decisions are also being made. At the project level, however, when decisions are made concerning the type of presentation formats to be employed, cost-effectiveness strategies are most appropriate. At all levels, we should employ cost accounting procedures to evaluate unit or project performance. None of the cost evaluation strategies can be truly effective, however, until a data base concerning instructional development costs has been developed.

Figure 8. Point of Application

LEVEL	TYPE OF QUESTION	TECHNIQUE EMPLOYED
SOCIETAL		
Institutional/School	Should an ID Unit be Established?	Cost-Benefit Analysis
Departmental/Unit	Which Project Should be Funded?	Cost-Benefit Analysis
Project Team	What Medium Should be Employed?	Cost-Effectiveness Analysis
(All of the Above)	Is Unit/Team/Product Effective?	Cost Analysis
INDIVIDUAL/PERSONAL		

DEVELOPING THE DATA BASE

As was pointed out at the beginning of this paper, very little is known about the costs of instructional development. Some attempts are now being made to fill this void. Schaffer and Mory (1977) have developed an extensive cost recording system for use at the University of Delaware. Figure 9 presents the COST-ED Model developed by Education Turnkey Systems (1971) to determine the costs of development projects that they carried out for the state of Michigan. No matter what system is employed for determining the cost of a project, there are certain factors which should be included in any cost-evaluation report:

OBJECTIVES of the project being reported,
CONSTRAINTS on the freedom of choice within the project,
ALTERNATIVES evaluated in the report, and the
KEY COST FACTORS that are included in the estimates.

The first three factors have already been discussed in detail in an earlier section. "Cost factors" refers to the key costing assumptions that were made in developing the reported cost figures and will be discussed in detail in the following section.

If we are to develop an adequate data base concerning instructional development costs, with a generality beyond the institution which developed the data, certain reporting requirements must be met. Costs need to be related to resource categories, to steps in the instructional development process, and to stages in the life cycle of the project. Figure 10 illustrates the concept of project life cycle costing. Any project goes through a process of conception, life, and termination. The phases comprising this process are research and development, installation, and operation and maintenance. These phases take place at different times and call for different concentrations of resource expenditures. The major concentration of expenditures for technologically-based systems is normally during the installation phase. Under traditional strategies, the highest costs are during the operational phase. If operational costs are omitted from the estimates of project costs, therefore, a distorted picture of relative costs will be presented.

A recommended format for reporting the costs of instructional development activities is presented in Figure 11. This format displays the costs under three major sections reflecting the three phases of a project's life cycle. It might be possible, if the instructional development process followed by a project team has clearly defined and consistent stages, to subdivide the research and development phase so as to correspond to the ID process steps. In most cases, this is difficult if not impossible to do. In any case, all resources utilized in the project

Figure 9. The COST-ED Model

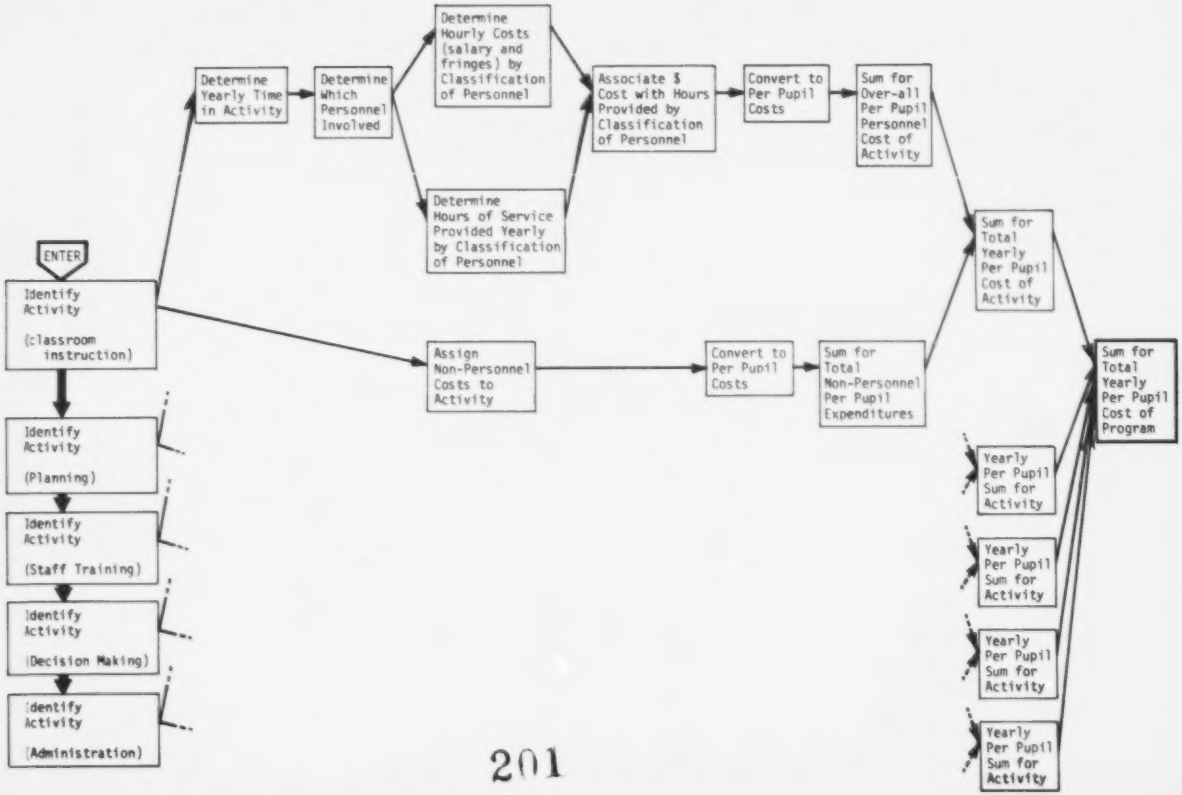

ENTER
Identify Activity (classroom instruction)
Identify Activity (Planning)
Identify Activity (Staff Training)
Identify Activity (Decision Making)
Identify Activity (Administration)
Determine Yearly Time in Activity
Determine Which Personnel Involved
Determine Hourly Costs (salary and fringes) by Classification of Personnel
Determine Hours of Service Provided Yearly by Classification of Personnel
Associate $ Cost with Hours Provided by Classification of Personnel
Convert to Per Pupil Costs
Sum for Over-all Per Pupil Personnel Cost of Activity
Assign Non-Personnel Costs to Activity
Convert to Per Pupil Costs
Sum for Total Non-Personnel Per Pupil Expenditures
Sum for Total Yearly Per Pupil Cost of Activity
Yearly Per Pupil Sum for Activity
Yearly Per Pupil Sum for Activity
Yearly Per Pupil Sum for Activity
Yearly Per Pupil Sum for Activity
Sum for Total Yearly Per Pupil Cost of Program

Figure 10. Project Life Cycle Costing

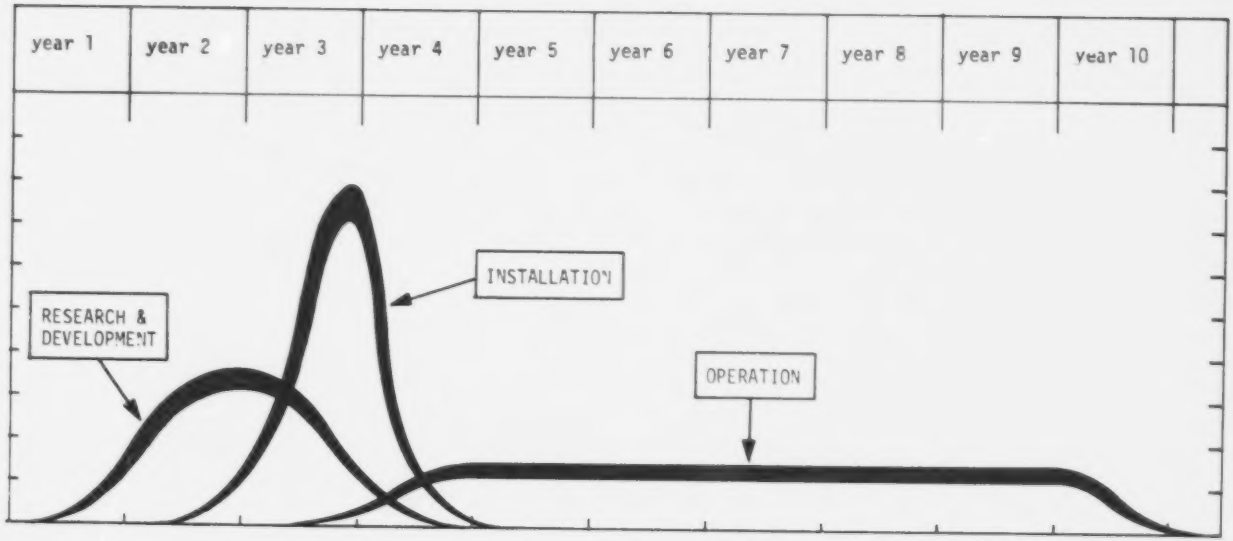
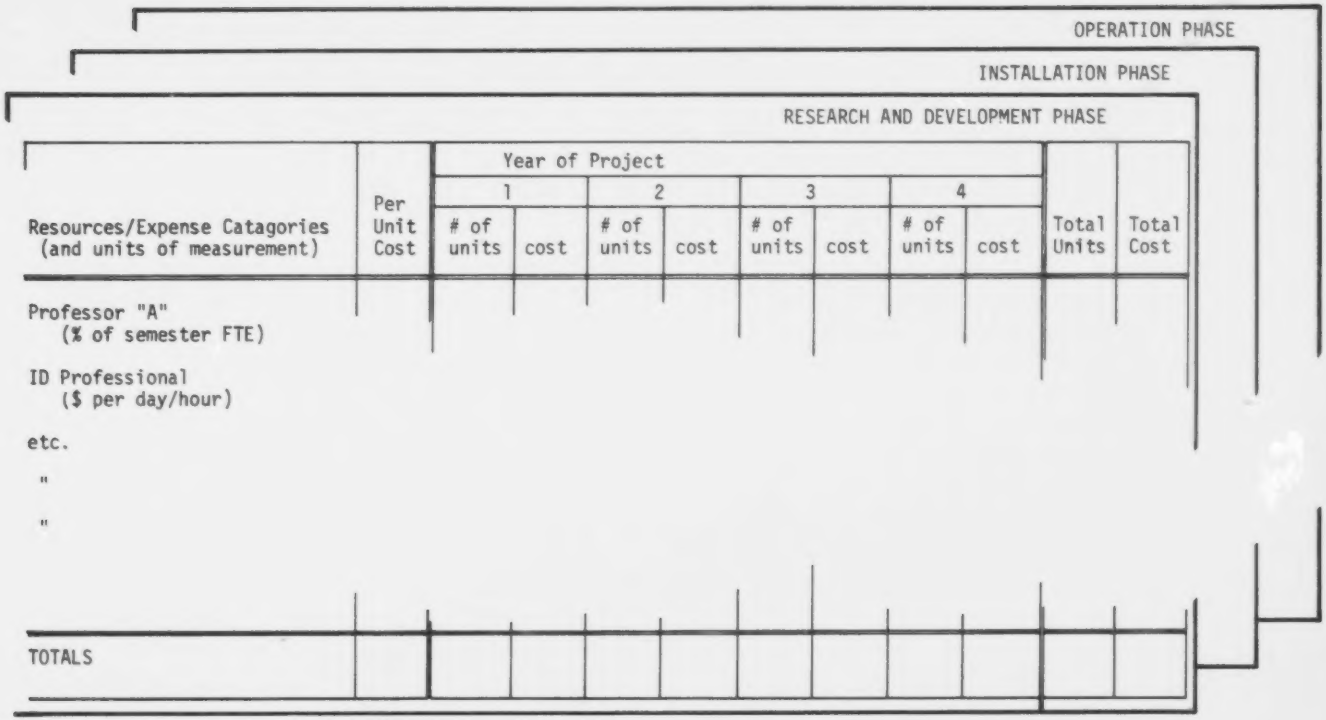


Figure 11. Suggested Format for Project Cost Reports



are fully described and the amount of each resource consumed is reported as well as its cost. This information is necessary if the reports are to be of use to individuals working in a different institutional setting or at a different time.

EFFECTIVE VS. TRUE COSTS

Up to this point, costs have been treated in an absolute sense. This is necessary if we are going to establish the true cost-effectiveness relationships for various instructional strategies. In the real world, we need not necessarily do this. Total costs are neither necessary nor desirable in the case of many of the questions which might be examined using economic evaluation strategies. The costs that are relative (effective) for a particular decision depends on the decision to be made and who is going to make the decision (Gephart, 1969). The cost of a faculty member's time is not relevant to a decision to initiate a particular instructional development project if that faculty member is not paid out of the instructional development unit's budget. This cost, however, would be of major importance at a higher level of the organization. The cost of developing a new instructional strategy is not relevant to a decision to implement or not implement that strategy if the development has already been completed. Some factors are variable — in either the cost category or the benefit category — depending on who is making the decision — for example, registration fees, which are cost items for students, are income or benefit items for administrators.

A number of cost accounting concepts are useful to the instructional developer when converting true costs to effective costs for the purpose of decision making. Some of these concepts are:

SUNK COSTS

Under this concept, any expenditure that has already been made can be treated as irrelevant to further decision-making. Therefore, money already expended on a project is not considered to be a part of the project cost when comparing that project with alternative projects. A project with a low cost-benefit ratio might very well be chosen over a more productive project because of a reduced effective cost.

INHERITABLE ASSETS

If a project can make use of resources that are currently on hand, the cost of these resources need not be included in the total cost estimate of the project.

Figure 12. Simplified Cost-Effectiveness Analysis Worksheet

FUNCTIONS	ALTERNATIVES		
	1	2	3
Needs Assessment			
Validate Objectives			
Validate Analysis			
Prototype Work			
Field Test			
Installation			
TOTAL COSTS			
OBJECTIVES			
Retention			
Time			
Attitude			

OPPORTUNITY COSTS

> The true cost of any activity is the lost opportunity to undertake some other activity. The items that would bear an opportunity cost vary from level to level within the organization. Items which would not be cost items to the instructional development unit, such as the client's time, room, space, and lights are cost items to the school administration, which has the ability to redeploy these resources in other competing activities.

The fact that so many cost items can be ignored in the decision-making process makes it even more important that complete resource consumption records be kept for all projects, even if the cost of these resources do not effect the decision-making process. Only then can a true picture of instructional development costs emerge.

SIMPLIFYING THE TECHNIQUES

The methodology of economic evaluation as it might be applied to instructional development decision-making has not been fully developed. Such evaluation techniques are primarily a way of analyzing decisions which force administrators to think through their objectives, to consider costs as well as achievement measures, and to consider alternatives to their preconceived solutions. There is a need for the development of simplified forms of the basic techniques so that developers may apply the concepts without an extensive background in economics or cost accounting. A preliminary effort along these lines is illustrated by the worksheet for performing rough cost-effectiveness comparisons presented in Figure 12.[1] The developer is to make estimates of the costs and of the outputs for each of the alternatives being considered. These are to be placed in the appropriate boxes on the worksheet. Total costs are then determined for each of the alternatives. The decision maker can then arrange the trade-offs between cost and productivity in order to select among the alternatives. As such simplified techniques are further developed, economic evaluation strategies will begin to find a greater acceptance within the instructional development process.

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[1] Dr. Thomas Schwin, personal correspondence.

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CHAPTER XI

COLLECTIVE BARGAINING: ADVERSARY OR COLLEAGUE?

By
Dennis R. Schaffer

Based upon their study for the Carnegie Commission, Ladd and Lipset (1976) found that an enormous potential existed for the further growth of faculty unions. By the beginning of 1976, about 95,000 faculty members out of an estimated 600,000 were employed at unionized schools in America and bargaining agents were selected to represent the faculties of 294 institutions with over 410 campuses. Opinion surveys indicated that more and more faculty members were inclined to accept collective bargaining. In fact, 72% indicated they would vote for a union if a collective bargaining election were to be held at their institution. Ladd and Lipset predicted that: "unionization is the wave of academe's future" (p. 11). Recent collective bargaining in higher education has resulted in the emergence of several trends. Two of these trends were identified by Mortimer and Lozier (1972) as: (1) greater codification of faculty-administrative relations, procedures, and policies; and (2) the widening scope of subsequent collective bargaining contracts which, after the initial contract, may expand beyond terms and conditions of employment. As the scope of subsequent contracts broadens, a faculty member's work load is becoming more specifically defined. The analysis of collective bargaining agreements with respect to faculty work loads by Mortimer (1974) found such esoteric considerations as attendance at graduation ceremonies recorded under articles dealing with work load. If the trend toward specific time allocations for instructional efforts continues, will the faculty member flexibility needed during instructional development be lost?

While instructional developers such as Diamond are trying to depart from the "simplistic teacher/student ratio" (1974), more collective bargaining agreements are stating specific teacher/student ratios. During a faculty seminar at the University of Delaware, the merits of the audio-tutorial method were discussed. Benefits, such as accommodating more students with less staff and increasing individual student's contact with senior instructors, were challenged as possibly being in conflict with the collective bargaining agreement. The collective bargaining agreement at the University of Delaware (1975), Article XI, 11.4 states that "the planned student-bargaining unit faculty ratio will not exceed 18.3 full-time graduate and undergraduate students per member of the bargaining

unit in the University as a whole." If an innovative, instructional method can be challenged as being in possible conflict with negotiated articles of agreement, is not instructional development equally vulnerable?

Diamond (1973) finds that the educational programs of most colleges are much as they were thirty years ago. He states that "The three-hour-a-week course, the division of academic subjects, the content of the curriculum, and the roles of teacher and student remained for the most part static" (p. 15). Though Diamond believes that a need for the development of more flexibility and creativity in educational programs exists, the collective bargaining agreements have defined work loads in terms of past practices. Again as an example, Article XI, 11.2 of the University of Delaware's collective bargaining agreement (1975) states that "The composition of a normal work load within a unit will be consistent with past practice within that unit."

A persistent problem in higher education discussed by Ullmer and Stakenas (1971) is the traditional adherence to the lecture method. Conceivably, the only major instructional technique consistent with past practice in a department is the lecture. Since instructional development efforts at most campuses are of relatively recent origin, if they exist at all, at how many universities and colleges is instructional development institutionalized to the extent that it could come under the "consistent with past practices" clause?

Numerous questions have been raised across the country as to the potential impact of collective bargaining upon instructional development. The following two research studies try to answer some of the preceding questions. The studies were conducted by an instructional developer at a state university with a union. Though the developer does not intend to become a scholar in collective bargaining, he does consider it important that he understand the potential problems and benefits of collective bargaining for instructional development.

The first study (Schaffer, 1976) was conducted to determine what has been the actual impact of collective bargaining upon instructional development.

By surveying members of the Division of Instructional Development (DID) of the Association for Educational Communications and Technology (AECT) concerning their experiences with collective bargaining, an attempt was made to understand the past, present, and future effects of collective bargaining upon instructional development. The central issue raised was whether or not collective bargaining should be considered an adversary or a colleague of instructional development. Instructional development encourages a collegial approach to instruction. Using a systematic approach, an instructional developer brings together the instructor and instructional resources to achieve the maximum educational

impact. The balancing of these resources is many times only achieved by compromise, flexibility, and extra work. Sometimes this balancing is tenuous and subject to collapse from external forces.

To determine if collective bargaining was already asserting an adverse influence, a survey consisting of questions about collective bargaining and instructional development was prepared with the assistance of various officers and members of the DID. A random sample of 197 DID members was drawn. Approximately 29% of the total membership of the DID were surveyed by questionnaire. Two mailings realized an approximate return of 59% (N = 166) from the division members surveyed. Due to no forwarding address, 8% of the questionnaires were returned by the post office. As in the case of Hoban's study (1974), the nonrespondents (33%) were not considered an atypical group but were viewed as not primarily engaged in the field of instructional development. For analysis, the primary roles of the DID members were consolidated into three categories with the respective response rates of Instructional Developer (33%), Administrator (40%), and Teacher (27%).

Age, sex, union membership, type of institution, and manner of union representation at the institution were thought to be important for describing the Division for Instructional Development's membership. The statistically average respondent was (Table 1): male (78%), between 31 and 50 (62%), with neither present nor past union membership (67%), at a public (83%) institution of higher education (71%), with some manner of union representation (46%). A comparison with Hoban's study (1974) of instructional developers indicated a trend toward younger developers. Hoban found the majority (54%) of the DID members to be 41 years old or older, while Schaffer found 53% between 20 and 40. More females have also joined the DID (from 9% in 1973 to 22% in 1975). Both studies found college campuses dominating the locale of the members (Hoban, 77% and Schaffer, 71%). Aside from minor differences, Schaffer assumed that Hoban's description of instructional developers was applicable to his study.

Schaffer found that DID members (46%) were located at institutions with union representation. Considering that 16% of higher education institutions have union representation, it seemed that collective bargaining was very close to home for most DID members. Unions were perceived by a majority of the DID members to be moderately (60%) to very (21%) valuable in our society. Though members believed faculty should be allowed to unionize (85%) and strike (61%), only 38% indicated they would actually support a strike by faculty. These findings were similar to the Ladd and Lipset study of faculty which found a surprising amount of support for collective bargaining. The low rate of support for a strike probably reflects the reality that it is easier to abstractly support collective bargaining than to actually man the picket lines.

TABLE 1

RESPONSES IN PERCENTAGES* TO QUESTIONNAIRE ITEMS ON COLLECTIVE BARGAINING BY INSTRUCTIONAL DEVELOPERS (ID), ADMINISTRATORS (ADM), TEACHERS (TEACH), AND ID, ADM, AND TEACH COMBINED (ALL)

Item		Group			
		ALL	ID	ADM	TEACH
1.	Age:				
	20–30	17	21	20	9
	31–40	36	45	30	34
	41–50	26	11	30	38
	51–60	14	11	17	13
	Over 60	7	13	2	6
2.	Sex:				
	Male	78	79	78	78
	Female	22	21	22	22
3.	Type of institution:				
	Public	83	79	80	91
	Independent/denominational/ non-degree granting	17	21	19	0
4.	Highest degree offered:				
	Certificate/diploma/none	11	19	9	0
	AA	8	0	20	6
	BA/BS; MA/MS; and Ph.D./Ed.D.	63	79	70	87
5.	Present or past active membership in any union:				
	Yes	32	29	33	34
	No	67	68	67	66
6.	Collective bargaining agency representing the faculty:				
	None	44	39	48	44
	AAUP, NEA, AFT, AFL–CIO, Local	46	45	46	50
	Don't know	8	11	7	6

Cont'd

TABLE 1 (Cont'd)

7. Overall evaluation of the value of unions in our society:				
Little value	10	8	11	13
Moderate value	60	63	61	56
Very valuable	21	26	22	13
Don't know	6	3	4	13
8. If faculty should be allowed to unionize:				
Yes	85	89	85	81
No	10	11	7	16
Don't know	3	0	4	3
9. If faculty should be allowed to strike:				
Yes	61	63	57	66
No	27	24	30	25
Don't know	11	13	11	9
No response	1	0	2	0
10. Support a strike by faculty:				
Yes	38	47	35	31
No	35	24	39	44
Don't know	22	29	15	25
11. Effect collective bargaining will have upon the quality of instruction:				
Improve quality	9	8	7	16
Remain the same	13	32	33	28
Erode quality in education	25	21	30	22
Don't know	30	37	22	34
12. The extent that as subsequent collective bargaining contracts are negotiated, a widening scope of issues emerge and negotiations are not limited to salary and work load concerns:				
Extensive occurrences	9	11	7	9
Some occurrences	22	26	22	16
No trend noted	59	53	59	66
13. The extent of increase in specific rules regarding faculty and administrative relations, procedures, and policies in collective bargaining agreements:				
Extensive occurrences	12	13	13	9
Some occurrences	28	39	22	25
No trend noted	47	39	46	56

Cont'd

TABLE 1 (Cont'd)

14. Effect of the widening scope of subsequent contracts upon instructional development:				
Positive effect	23	21	22	28
No effect	11	11	17	3
Negative effect	41	37	43	41
Don't know	22	32	15	22
15. Effect of an increase of specific rules and policies upon instructional development:				
Positive effect	17	21	11	22
No effect	9	8	15	3
Negative effect	38	37	37	41
Don't know	26	29	24	25
16. Attempts through collective bargaining to negotiate provisions for release time, money, staff, and facilities for instructional development:				
No attempts	54	61	52	50
Some attempts	28	29	28	28
Extensive attempts	2	0	0	6
17. Belief that instructional development will be adversely affected by collective bargaining:				
Yes	34	26	33	44
No	30	39	28	22
Don't know	29	34	30	22

*Percentages do not total 100%, since 'no response' category has not been included for table brevity.

When asked what effect collective bargaining would have upon the quality of instruction, only 9% thought instruction would be improved, while 25% believed that collective bargaining would erode quality, and 30% did not know the outcome. Many of the Instructional Developers' written comments to this question expressed hope mixed with skepticism that collective bargaining would improve many working conditions for their faculty and the quality of instruction. One person thought that union concerns seemed to be centered more on the instructor than on the student, and therefore, instruction would suffer. Another developer felt that though collective bargaining should improve instruction

at his college, he would oppose it with vigor if he ever felt there was any eroding of quality. The most extreme reaction came from a developer who believed that a strike is the lowest form of protest and should not be engaged in by professionals.

Administrators also tended to be skeptical about collective bargaining improving the quality of instruction. One man thought that teachers would only do the required minimum under collective bargaining conditions and would not voluntarily involve themselves in instructional development efforts. If instructional development efforts were required under the contract, the instructional developer could then be in the middle of a fight between administration and faculty. Some teachers also noted serious dangers to the quality of education if contracts caused power struggles between administrators and faculty. Though many comments reflected a concern that collective bargaining would erode the quality of education, most respondents were not really sure that this would occur.

Responding to trends noted in the research literature on collective bargaining, 59% found no trend towards subsequent collective bargaining contracts widening the scope of issues negotiated from salary and work load concerns. Also, 47% noted no trend towards an increase of specific rules regarding faculty and administrative relations, procedures, and policies in collective bargaining agreements. Though the respondents noted no local trend towards more specific rules, they viewed any such possible trend as having a potentially negative effect upon instructional development efforts.

A recurring theme in many comments was apprehension that as more rules and red tape emerged, creativity, innovation, and subsequently instructional development will suffer. Other themes included: collective bargaining contracts tended to fit everyone into a specific, potentially stifling role; the rule-making process would polarize faculty and administration and lead to a breakdown of information, communication and cooperation; and an apprehension as to the future relations between administrators and faculty, with instructional development becoming a "privilege" or a "concession" within a power struggle.

Two other interesting results were found in the Schaffer study. First, there were attempts being made to negotiate provisions for release time, money, staff, and facilities for instructional development. This finding was consistent with a national trend towards the emergence of a widening scope of issues after the first contract. Second, 29% did not know whether instructional development would be adversely affected by collective bargaining. Apparently, many DID members were not sure as to the potential impact upon instructional development of the various issues surrounding collective bargaining. Instructional developers were shown by the study to be more optimistic than teachers.

The research literature indicates that there will be major changes within any institution which selects a bargaining agent, but the Schaffer study found it difficult to fully estimate the implications of collective bargaining upon instructional development. Although an overall analysis of the results of the study did not indicate any past or present major problems for instructional development, it was evident that the potential existed. According to 72% of the respondents to the Schaffer study, implications of these changes on instructional development must be the concern of everyone engaged in the improvement of instruction.

Unions, strikes, and students represent a contemporary combination of variables emerging in American higher education. What actual impact students will have upon collective bargaining and, subsequently, upon instructional development is a speculative matter. Bond (1974) examined some student concerns regarding faculty unionism. She believed that students are concerned with the effect collective bargaining will have on the quality of university instruction and student participation in university governance. One concern expressed was over the absence of students at the bargaining table and thereby the forfeiting of their role in university decision-making.

Various recommendations were made as to how student involvement in collective bargaining might best be accomplished. Some of the strategies suggested included extending observer status to students at negotiations, seeking judicial intervention to prevent faculty strikes, and lobbying for legislation. Bond believed that students should not be content with only observer status but should seek a more active role in the bargaining process.

The proposed active role included lobbying for legislation to allow students to participate in bargaining sessions, representation by counsel, the right to caucus and the right to identify issues over which students could, as provided by statue, exercise a veto power. Materialization of Shark's (1973) prediction, that the day is approaching when students will be manning their own picket lines, will be the result of the willingness of students to assume a more active role. Bucklew (1973) indicated that the "chronology of student activism of the last half century indicated a pattern of increased willingness on the part of students to adopt an independent, adversarial posture toward the university" (p. 1).

The purpose of a second Schaffer (1975) study was to determine the degree of willingness and the ability of students to adopt a more "independent, adversarial posture" as related to collective bargaining in higher education. This study provided a basic analysis of the impact of collective bargaining in higher education attributable to students. If Bond's concerns were shared by significant numbers of undergraduates, tripartite bargaining among faculty, administration, and students could

become a future reality in higher education and, thus, another concern for instructional developers.

A Student Opinion Survey (SOS) was administered to a group of randomly selected undergraduate students at the University of Delaware during November, 1974. Student interviewers personally contacted each student to administer the questionnaire. They were successful in having 75% of the selected group (363 students), complete the questionnaire. The SOS contained 14 items concerning student perceptions of collective bargaining and its impact on student life. An introductory statement defining collective bargaining was read to each student prior to his responding to SOS items (See Note on Table 2). Demographic questions were asked concerning academic major, academic year, sex, and grade point index. Percentage tabulations, multivariate analysis of variance, and discriminant analysis were performed on the data to isolate variables.

Of the 363 undergraduate respondents, only 14% had been or were currently members of a union while 28% indicated that at least one of their parents had been a union member. Unions were considered to be of great or average value to our society by 95% of the students. Though 54% of the sample thought that faculty should be allowed to unionize, only 17% could identify the present faculty collective bargaining agency at the University of Delaware. When asked if the role of students in university governance would be increased as a result of collective bargaining, responses indicated 48% did not know, 23% felt it would be increased, 21% felt it would remain the same, and 8% saw a reduced role. In regard to the quality of university instruction, 38% did not know what effect collective bargaining would have on instruction with 25% believing instruction would be eroded and 24% predicting improvement. A response by 83% of the sample showed strong belief that an effect of increases in salaries and fringe benefits for faculty would be higher tuition for students. Though 70% of the undergraduates believed that public employees should be allowed to strike and 61% felt that faculty should be allowed to strike, only 21% indicated that at present they would support a strike by university faculty.

Multivariate analysis of variance and discriminant analysis were performed to determine the following relationships among the following variables within the SOS: (a) grade point average, (b) class standing of students, (c) academic major, (d) sex of the student, (d) if the student was or had been a member of any union, (f) if the student believed that faculty should be allowed to strike, and (g) if the student would support a strike by university faculty. Overall, F ratios were found non-significant for respondents' grade point average, class standing, or academic major. Interpretable results were found for the other relationships.

TABLE 2

PERCENTAGE TABULATIONS OF QUESTIONS FROM THE STUDENT OPINION SURVEY (SOS)

SOS Items	All Respondents	Male	Female
1. Are you now or have you been a member of any union?			
1) Yes	14	24	5
2) No	86	76	95
2. Are either of your parents now or have they been a member of any union?			
1) Yes	28	27	30
2) No	62	64	62
3) Don't know	10	9	8
3. What is your overall evaluation of the value of unions in our society?			
1) No value at all	5	7	3
2) Average value	57	48	64
3) Very valuable	38	45	33
4. Do you believe that public employee collective bargaining is bad public policy?			
1) Yes	6	8	5
2) No	68	71	65
3) Don't know	26	21	30
5. Are civil rights issues involved in allowing public employee collective bargaining?			
1) Yes	43	46	40
2) No	10	11	8
3) Don't know	47	43	52
6. Do you believe that university faculty should be allowed to unionize?			
1) Yes	54	60	50
2) No	20	22	50
3) Don't know	26	18	31

Cont'd

TABLE 2 (Cont'd)

7. What collective bargaining agency (union) now represents the faculty at the University of Delaware?			
1) Don't know	76	75	78
2) AAUP	17	20	14
3) NEA	5	3	6
4) AFT	2	2	2
5) AFL–CIO	0	0	0
6) Other	0	0	0
8. What impact will collective bargaining have upon the participation of students in university governance?			
1) Increase	23	25	22
2) Remain the same	21	28	15
3) Reduce	8	6	7
4) Don't know	48	41	56
9. What impact will collective bargaining have upon the quality of university instruction?			
1) Improve quality	24	25	23
2) Remain the same	25	30	20
3) Erode quality	13	15	11
4) Don't know	38	30	46
10. Do you believe that students must involve themselves in the collective bargaining process or forfeit their role in university decision making?			
1) Yes	40	38	42
2) No	30	41	21
3) Don't know	30	22	37
11. What effect will increases in salaries and fringe benefits won by faculty unions have upon tuition rates?			
1) Increase	83	89	79
2) Remain the same	2	2	3
3) Reduce	1	0	2
4) Don't know	14	9	16
12. Do you believe that public employees should be allowed to strike?			
1) Yes	70	67	72
2) No	22	24	20
3) Don't know	8	9	8

TABLE 2 (Cont'd)

13. Do you believe that university faculty should be allowed to strike?			
1) Yes	61	61	61
2) No	27	26	28
3) Don't know	12	13	11
14. Would you support a strike by university faculty?			
1) Yes	21	22	20
2) No	36	35	37
3) Don't know	43	43	43

NOTE: Of 484 students sampled, 363 completed questionnaire (75%) and heard the following statement read prior to responding to the SOS items: "The following questions are concerned with the role of unions and the process of collective bargaining. Collective bargaining is the negotiation between an employer and union representative usually on wages, hours, and working conditions, which results in a legally binding contract."

Regarding the respondent's sex, the analysis isolated SOS items 1, 4, 6, 8, 9, and 11. For items 4, 6, 8, and 9, females had a higher "do not know" response rate than males. On item 1, only 5% of the females were or had been a member of a union (24% for males). The interpretation attributed to this finding was that females differ from males due to their lack of association with unions and issues related to collective bargaining in higher education. When analyzing the effect of union membership, items 8, 9, 10, and 11, which directly dealt with the impact of collective bargaining on student life, had significant univariate F ratios but they failed to form a pattern. The percentage tabulations of items 8, 9, and 10 indicated large responses to the "don't know" option for each item (48%, 38%, and 30%, respectively). The students seemed certain that increases in salaries and fringe benefits won by unions would increase tuition, but had no consensus regarding what other impact collective bargaining would have on their lives. Other results indicated strong beliefs by students that university faculty should be allowed to unionize and to strike. Support was shown also for the right of public employees to strike. Various items (3, 4, and 5), with significant univariate F ratios, also indicated that students perceived unions to be of value in our society and that collective bargaining for public employees was not perceived as bad public policy. Though SOS items 3, 6, 9, 12, and 13 indicated strong student support for unions and collective bargaining in general, only 21% would support a strike by faculty with 43% undecided on this issue. Students apparently were

not ready to support an actual faculty strike, since it would have direct impact on their lives.

The results of this study did not indicate a situation favorable to the assumption by students of a more active role in collective bargaining in higher education. Demographic analysis found only a small percentage of the students having had any direct experience with unions as members. The only demographic characteristic to have an overall significant F ratio for discrimination was the student's sex. The significance apparently was based upon the lack of association of females with unions in our society.

Assertions that students are concerned with the effect of collective bargaining on the quality of instruction and student participation in university governance were not substantiated. Questionnaire items designed to demonstrate the degree of student concerns failed to form significant patterns. Though students seemed certain that increases in salaries and fringe benefits won by unions would increase tuition, they failed to discern whether or not collective bargaining would have any additional impact on their lives. The presence of the large percentage of "don't know" responses to the various impact questions seemed to reflect a genuine lack of understanding as to what the actual impact might be.

Overall, students seemed supportive of unions and recognized their value in our society. They believed that public employee collective bargaining was not bad public policy and extended this belief to include higher education. The findings indicated strong support for the right of university faculty to unionize and strike. Though students indicated general support for unions and collective bargaining, only 21% reported willingness to support an actual faculty strike. Again, it seems that as issues become specific to student lives, they were not able to be as decisive. At the present time, the willingness or the ability of students to adopt a more "independent, adversarial posture" in collective bargaining is questionable. Whether this will change in the future will probably depend upon whether collective bargaining continues to be experienced vicariously by students or whether it begins to have a direct impact upon their lives.

Returning to the central issue that collective bargaining raises for instructional development: Will collective bargaining enter into a more adversarial or collegial role with instructional development? Since the ramifications of collective bargaining in education are as numerous as the permutations of the different types of institutions, faculty, and social conditions that exist, generalizations are difficult to make. Obvious results of collective bargaining activities will be major changes in faculty-administrative relations, terms and conditions of employment, and governance. As Mortimer and Lozier noted, while the scope of

initial collective bargaining agreements may be limited, the scope of what is negotiable in the future is not limited.

Implications of these changes for instructional development efforts must be the concern of everyone engaged in the improvement of instruction. Mortimer and Lozier (1972) advise institutions involved in collective bargaining "to plan carefully what can be achieved through the process to enhance the institution's effectiveness" (p. 33). They imply that higher education could be a victim of collective bargaining rather than the recipient of its benefits. They also warn that basic freedoms should not be treated lightly or sacrificed to the general desire to reach an agreement. It is possible that such agreements will enhance educational impact if they are put together wisely and with some understanding of their implications. A possibility exists that if innovative instructional methods can be in conflict with negotiated articles of agreement, so can instructional development efforts.

Of course, the selection of a collective bargaining agent at a college is not in itself a harbinger of doom for instructional development. The collective bargaining process can also offer an opportunity for greater implementation of instructional development. Provisions for released time, money, staff, and facilities for instructional development could be negotiated as easily as the more esoteric items.

At this time it is difficult to estimate the full implications of collective bargaining upon instructional development. It is evident that there will be major changes within any institution which selects a bargaining agent. If these changes are to enhance educational impact, it will be the result of the efforts of bargaining teams to understand the full implications of the various articles of agreement. Instructional developers will need to provide information to and consult with bargaining team members on the implications for instructional development.

An instructional developer cannot operate independently of or in control of these influences. The individual instructional developer in each institution is going to have to come to terms with collective bargaining. For if he fails to appreciate the implications of collective bargaining for instructional development, he may find himself negotiated out of the educational improvement process. He must realize that collective bargaining can serve as either a colleague or an adversary to the unwary instructional developer.

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CHAPTER XII

THE CHALLENGE FROM WITHIN: SOME UNPOPULAR VIEWS ON INSTRUCTIONAL DEVELOPMENT TOPICS

By
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and
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Is instructional development (ID) destined to be the salvation of formal education? Maybe, but probably not. There is even some doubt that ID will so much as make a lasting mark on the educational process. These are neither words of heresy nor a prophesy of doom. Rather, this is an analysis which attempts to speak to realities. Consider a critical element of evidence: after several years we perceive no signs of a significant movement to "develop" instruction. To the contrary – only a miniscule fraction of instruction at any level has received the benefit of systematic development (ID). Consider also the fact that there is no evidence of any national movement toward the promotion of ID. For example, the jury is still out on the Instructional Development Institute (IDI). IDI is a heavily funded national program for the promotion of instructional development. Sadly, after several years of activity, principally on the K–12 level, IDI has had little impact. It is a rare educator who has even heard the term. That raises a sticky question or two, such as, "Is it possible to bring about the kind of reform implied by ID when many people will not even admit there is a problem?" Or, if that question doesn't draw confused or conflicting answers, how about a question a bit below the belt, such as, "If the ID people are smart enough to be offering fancy solutions to problems, why can't they solve their own communication problem with the rest of the field of education?" Maybe these are questions without answers, but since each gives rise to some antisocial thoughts, we suspect that the questions merely lack agreed upon answers.

There are other questions concerning ID that do not yet have agreed-upon answers. That lack of agreement means controversy. Here, for example, are ten additional questions, guaranteed to draw frowns and scowls at any AECT/DID conference meeting. Ask any of these questions and watch your popularity plummet:

1. In understandable terms, what is Instructional Development? (Insist that the mumbo jumbo in the AECT Glossary needs to be re-phrased for you.)

2. What is included in the ID process?
   (Be sure you find out if anything on the list can be left out and if anything can be added.)
3. How can we best achieve impact through ID?
   (You might want to find out what impact really means in ID circles before asking this question.)
4. Can we really afford to have impact, or is cost effectiveness an integral part of impact?
   (The idea is to keep effectiveness, efficiency, and economics "up front" simultaneously until you learn what really counts.)
5. Why is it so difficult to utilize the concept of "individualization" in ID?
6. Who sets the goals of ID?
   (With a hat full of competing constituencies, this question has more disruptive punch than a small A-bomb.)
7. What are the goals of ID?
   (And how many angels can dance on the head of a pin?)
8. Who sets the priorities when some ID projects are selected and others rejected?
   (This question is obviously fraught with discrimination overtones and can be a question of equal opportunity for maximum effect.)
9. Who should do the work in an ID project?
   (Because everyone in academe believes he or she is overworked, try a variation of this question which lets it be known that the purpose of your question is to pass the buck.)
10. What is shotgunning?
    (Insist that exact guidelines are needed. Do not settle for a vague or general answer.)

Some of our readers who are familiar with any of several ID models will already have identified what we have done by setting forth the nasty questions. In "systems" parlance we have been busy doing needs assessment. We have been delineating the problem. By suggesting that our ultimate job is to *answer* these sticky questions we have started a task analysis. Because we know what we want to find out, our objectives beg to be specified in measurable terms.

How much further can we go following this systems metaphor? Well, we can consider our factual resources, weigh alternatives, and suggest strategies which, if adopted, would constitute a prototype of a real world ID model. What we can *not* do is eliminate the sticky questions one-by-one. The whole mess is far too interwoven. We find both divergence and unity in this situation. The issues are distinct but

not discreet. As a consequence, we will first present a passing notation of the clusters into which the questions tend to fall. Then the subject will be treated on a topical basis.

From looking at the kinds of questions about ID which need to be resolved, we find that they fall into the following areas: 1) Verbal Issues—the word problems, i.e., definitions, terminology and conceptual theory; 2) Impact Issues—issues related to the nature and degree of the impact of ID, including the controversial "shotgunning" issue; 3) Power and Policy Issues—the setting of priorities and the whole realm of restrictions to be placed on what ID is, how it functions, and who participates; and, 4) Procedural and Professional Issues—including the appropriate activities for diffusion of ID. The reader should not expect cohesive analyses of each of these issue clusters, *per se.* They, like the questions themselves, are so intricately interwoven that they cannot be separated. Although most current challenges to ID are to the verbal cluster, they almost inevitably involve the other three clusters too. For that reason, definition—the key to the word problems—needs to be the first topic discussed.

DEFINING INSTRUCTIONAL DEVELOPMENT

The profession does not completely agree upon how it should define itself or its process. The lingering disagreements persist because definition is closely related to philosophical positions. Thus, opening this topic will help to illuminate the authors' philosophical perspective of ID. Much considered effort has gone into the problem of defining instructional development, and we offer three examples here. First, from the AECT Task Force on Definition and Terminology, we have the only "endorsed" definition:

> **INSTRUCTIONAL DEVELOPMENT:** A systematic approach to the design, production, evaluation, and utilization of complete systems of instruction, including all appropriate components and a management pattern for using them; instructional development is larger than *instructional product development*, which is concerned with only isolated products, and is larger than *instructional design*, which is only one phase of instructional development. (AECT, 1977)

The emphasis of the AECT definition seems to be upon inclusiveness. It is explicit in the definition that instructional design alone cannot be counted as ID. Following that logic, any endeavor which failed to meet *all* of the requirements of the definition would be something other than ID. This is a completely rational approach at the definitional level with only one flaw—it defines us out of business. The inclusiveness of process functions—that is, rigorous adherence to process structure—is far and away the exception rather than the rule in the real ID programs of American colleges and universities. Most faculty clients don't want

the whole rigorous ball of wax. Similarly, many projects don't warrant absolute process rigor. It seems counter-productive to have a whole trunk full of definitions to cover each distinct contingency. All of which leads us to a second definition, offered here for contrast in terms of its simplicity:

> **INSTRUCTIONAL DEVELOPMENT**: A goal-oriented, self-correcting process for the solution of instructional problems. (Braden, 1974)

Although the wording is brief, when this definition was first offered in 1973, the author found it necessary to load it with the following caveats:

> The process involves the use of a structured procedural model for the creation and/or revision of learning packages. The procedure provides for determination of objectives, application of systematic decision making, evaluation of outcomes, and introduction of feedback to facilitate revision. Implicit in the procedure is the consideration of current educational theory and technology in the identification of teaching-learning strategies and in the selection or production of instructional materials. Ideally, although the procedures are structured, neither the process nor the product is rigid—both being subject to the many forces which interact with the learning situation. (Braden, 1973)

When asked to respond to the above definition, Leslie P. Greenhill, from Pennsylvania State University, provided what might well be the best advice available on the subject, "I don't know why we bother to argue about what instructional development is or isn't. I just call what we do *instructional improvement* and let it go at that." Greenhill apparently vibrates on much the same frequency as Kent Gustafson who told the Philadelphia AECT convention that, "ID is . . . a process for improving the quality of instruction." (Davies and Schwen, 1972) This definition is at once simple and profound. We select this definition as being most operative in our philosophy of ID. Greenhill and Gustafson cut right to the heart of the matter. They offer a notion of ID that focuses upon instruction—the learning event—and thus the learner. They also, we believe, speak to the true goal of most instructional developers.

THE STRUGGLE FROM WITHIN

Instructional development faces many challenges—several from within. The advocates of "my way" have had destructive effects on the ID movement. They have subverted or at least set aside the need to promote ID in the educational world. Misguided advocacies and lack of accord on matters of definition and theory among leading figures in ID have at the least confused the issues and diverted attention from

diffusion of the ID concept. One example of how the instructional development movement has been confused is through the Identity Error, perpetrated by some advocates of faculty development. Specifically, Gaff (1975) mistakenly subsumes ID, a *student*-centered activity, under *faculty* renewal, obviously a *faculty*-centered activity. Several authors, but most notably Bergquist and Phillips (1975, 1977), redefine ID in a faculty development mold. Also, Popham (1974), who should know better, is the author of the following statement which we assume is an honest mistake of definition: "An instructional development program is the current euphemism used to describe an effort *to improve the teaching skills* of university faculty members." [emphasis added] Popham was referring to *faculty* development, and the rest of his incisive remarks on that topic are truly worth reading.

For a moment, consider a few basic truths and generalities. For instance, faulty theory or misguided policy can lead us into errors of execution. Worse, theorists sometimes become advocates, unable to gracefully accommodate counter-theory. Policy makers can fall into the same trap when the theory of the process or the sequence of goals becomes important enough to those individuals to excite their missionary zeal. Advocacy gets things done, but there is no guarantee that the most successful advocate is backing the best program or course of action. It might be well to translate the above generalizations into real world ID examples.

Perhaps the best known example of restrictive theoretical advocacy is the ID dogma, "thou shalt not shotgun" as advocated by Diamond, *et al.* (1975). This is viewed as a stifling restraint and as frequently inappropriate advice by some developers, including the present authors. Still another example may be found in the 1977 marching orders of AECT's Division of Instructional Development (DID).

The very first words Silber (1977 a) wrote as president of DID were, "One of DID's major goals is to help professionalize instructional development." Subsequently, Silber (1977 b) showed that this was his *first priority* by devoting the entire first DID column in *Audiovisual Instruction* to the subject "Professionalizing Instructional Development." This is a policy error and an error of priorities. Rather than deal with the critical issues involved in promoting ID within the educational community, the DID leadership addresses issues of professionalism and certification. It would seem that rational priorities would require addressing the need for promoting ID before creating the trade union. Why worry about licensing professionals for whom there is no demand? We must beware, lest the field be accused of saying, "where there is short demand, limit the number of professionals."

FACULTY DEVELOPMENT – INSTRUCTIONAL DEVELOPMENT

In addition to a definition of instructional development, a differentiating definition of faculty development is needed. An objective appraisal of the current situation will show that the faculty development movement has done much to obfuscate the ID message. Many people confuse the two. Let us state clearly, *Instructional Development and Faculty Development are not the same things.* We have identified ID. How about Faculty Development? Faculty Development is a bag full of disjointed parts. Some of the components of faculty development are unpalatable to vast numbers of college faculty, e.g. in-service workshops. Other aspects of Faculty Development are weak attempts at featherbedding, e.g. retraining professors from overpopulated disciplines into needed teaching areas. Indeed, some Faculty Development proposals are a mixture of whimsy, folly, and naivete, e.g. "personality development" and personal growth programs. However, it is not this unflattering picture of the bits and pieces of faculty development that is most troublesome. Rather, it is a concern that there is neither direction nor cohesion in the movement. Thus, the major objection to faculty development is that it is a fad in search of substance.

Gaff (1975, p. 47) has clearly demonstrated that he understands the nature of ID. Yet, he persists in forcing ID into a *faculty renewal* mold. Gaff (1975, p. 99) classes faculty development, instructional development, and organizational development as instructional improvement programs for the purpose of faculty renewal. It is easy to understand Gaff's purpose in writing about instructional development under the mantle of faculty renewal, but it is an area in which we should tread cautiously, armed with commonly accepted definitions and an understanding of our basic premises. At first blush, Gaff's position does not seem so far removed from the standard ID practice of spreading ID by turning faculty clients into instructional developers in their own right. Take heed! Before you buy the faculty renewal connection, examine carefully the transition in thought and purpose that is injected by the Gaff notions. Instructional development is being served up as a nostrum for the pedagogically ill faculty member. Suddenly ID's ultimate purpose is to serve or improve the faculty member. The skills of ID (as they can be given to faculty) have supplanted in importance the purpose of using the ID process. How different that seems from the original conception that ID, a process focused upon the solution of problems and the outcomes of student learning, might best be spread by teaching the teachers how to apply the techniques of the ID process by themselves.

There can only be encouragement for any program that seeks to improve faculty performance. We therefore must all applaud faculty development intentions. However, those of us who are practicing instructional developers and all of our champions must rise up in righteous indignation when – in the name of faculty development – the focus of instructional development is listed as "Individual faculty, Individual courses, [and] Curricula." (Bergquist and Phillips, 1975, 1977) What happened to *learning?* What happened to individual students as the final and most important point of focus?

The present authors assert the premises that: 1) ID must yet be sold to the educational community, and 2) ID is a student-centered activity. Both premises are threatened from within the ranks of instructional technology. Threat one: we must contend that too many missionaries of faculty development do ID a disservice in the area of communication. By building an association between faculty development, instructional development, and organizational development that confuses the educational community, these faculty advocates make it more difficult to promote ID. Threat two: such fads as faculty renewal/faculty development would turn the ID process away from student-centered concerns and toward more self-serving faculty concerns. We are all in favor of programs that improve the lot of the faculty, but not when they are at cross-purposes with true reform in education.

The thing that the two threats just mentioned have in common is that they each speak to the issue of impact. The first addresses the *degree* of impact – the second speaks to the *nature* of the impact. Impact is an issue which cannot be avoided in instructional development. All of the ID theorists and practitioners, with their many differences in style and philosophy, are concerned about impact. We may challenge their beliefs or their approaches in these pages or elsewhere; however, it should be noted that the desire to have a favorable impact unites them all into a select group of very worthy people.

SHOTGUNNING

Within the ranks of practicing instructional developers in higher education there are differing opinions about the best methods for achieving impact. The philosophical battle lines are most clearly in focus when the impact issue is discussed in terms of "shotgunning." Diamond (1975) speaks most eloquently and emphatically for the anti-shotgun school.

> Maximum support must be given to each project undertaken, with no more projects underway than can be adequately supported.

> The shotgun approach does not work. Projects should be selected to meet institutional priorities that have been established for their potential impact. Supporting a series of small and unrelated efforts may make a lot of friends for the staff of the center and keep them busy, but the total and lasting effects will be minimal. A series of partially developed courses can consume much time, energy, and budget, but will result in less viability and acceptance than one or two completed projects that are both successful and operational.

There are scores of instructional developers around the country who operate shotgun programs. They operate quietly, because no one speaks for them with the eloquence of a Diamond. It is almost a temptation to say that no one speaks for them at all, but that is not quite true. While their instincts and the imperatives of their environments have sustained this legion of shotgunners, a faint word here and there has been said on behalf of their practice.

Holsclaw (1975) has been helpful in providing us with comments from four well-known professional instructional technologists that favor shotgunning. Holsclaw quotes Dale Hamreus of U.S. International University as saying:

> Attack the need. – The important issue should be "What is the need?" then "What are the resources that can be brought to bear upon the need?" Don't be concerned about whether it is "shotgunning" or not "shotgunning".

San Jose's inestimable Jerrold Kemp was enticed into offering this marvelous piece of advice: "Start small – prove your worth." George Voegel, the forceful dean of W. R. Harper College, was perhaps more neutral with his comment, " 'shotgunning' gives a quick turnaround on a small scale." Finally, Northeastern's Thomas Cyrs advised, "Use little projects to get big projects."

The shotgunning dichotomy is real. There are shotgunners, and there are several large ID operations that shun small projects and have anti-shotgun policies. If these latter operations serve their host institutions well, then let us all say "bravo." But let us draw the line there. Bridges, Diamond, and others, who are fortunate enough to run these programs, and who advise that others should adopt their *modus operandi*, may have missed the notion that what works well at one institution can be inappropriate at another.

Because this is an area of controversy, it is important to insure that the terminology is clear. Much of the controversy lies in the lack of agreement about what is or is not included in the developer's role. Diamond (1975) uses the term "major academic redesign" to identify the domain in which his brand of instructional development takes place. It is difficult to fault his frame of reference:

> It should be emphasized that the process . . . is designed to generate lasting or long-term changes – major redesigns in courses and in academic procedures (registration, scheduling, credit formats), and the evolution of new programs and curricula. While many faculty do innovate within the confines of their classroom, and while many campuses give extensive support to these activities, this type of effort rarely extends beyond a single class or beyond the tenure of the particular teacher in a specific course. What those responsible for the improvement of instruction are after are major and lasting improvements that will have long-range impact on the institution in which they take place.

Diamond goes on to sharpen the focus of his logic with a quick caveat and a succinct identification of the critical issue of impact.

> The support given the individual faculty member, while important for the climate of the campus and for the instruction within a single classroom, rarely solves major problems or effects institutionwide changes, and must be considered accordingly. Unless projects are selected for their relationship to the needs of the institution and their prognosis for durability once implemented, there will not be impact.

While the present authors agree that major academic redesign projects are important, they most emphatically insist that individual faculty projects are at least equally important. That, of course, is the essence of the controversy. Maybe an example would be helpful:

At Hypothetical U., the English department offers an introductory course, Comp. 101, as a service course to the university. All freshmen are required to take the course. There are 90 sections of Comp. 101, taught by 30 low ranking faculty and graduate assistants. All English faculty with any power base whatsoever are teaching courses other than Comp. 101. The 30 drones who have the onerous task of "teaching the freshmen to write" would all rather discuss lyric poetry than comma splices. The potential for "impact" from redesigning just one course, Comp. 101, is tremendous. Right? Wrong! Not under the circumstances described. There is no climate for lasting change. The change can be *imposed*, but it will fall far short of expectations unless there is a faculty demand for the change.

Continuing with our example, there is a mathematics professor at Hypothetical U. who wants to design a self-instructional course in modern number theory, Math 481, to serve four or five math majors each semester (the course is now taught on alternate years, and only if ten students can be scraped up who need and can handle the course.) The potential for impact is so low that no ID help should be offered to this

professor. Right? Wrong! How can we deny any student the opportunity to take what may be a capstone course in his field on the basis of inadequate demand, and how can we penalize those faculty who teach the most esoteric subjects by withholding support from them simply because only a few students ever reach high enough to need their knowledge?

At this point we can bring our example to a head: Assume the chairman of the English department is willing to work with the ID office in preparing a tightly structured course to be "managed" by the 30 drones. There are no other potential clients at the moment – just the Math professor and the English chairman. What do you do? Our answer is to shotgun. Take both clients. The English situation needs to be slow rolled so that time will be an ally in delivering faculty support. The math situation needs to be expedited so that the enthusiasm of this key faculty member can be fully exploited.

The example can be expanded to include redesigning a sophomore level class that attracts 30 students per semester. Unlike the Math example, no student need miss out on this instruction, but the faculty member who teaches it thinks it can be done better. Should he be supported? We think so. Consider the *negative impact* if he is not. In many ways the faculty member is the most important member of the ID team. He must be wooed, cajoled, and pampered, because his reputation and expertise are essential to the credibility of the ID product, whatever it might be. No ID operation, however well entrenched, can afford to reject or otherwise offend any faculty member.

The big secret about ID is that it can be done by the faculty member *without* the instructional developer. There! We said it. You have just been offered ID's first unspeakable fact. But that's not all. No ID operation anywhere can more than *begin* to do the job (unspeakable fact number 2). Look at the catalog of any college of even modest size. How many courses are offered? Hundreds? At large universities the offerings exceed a thousand or two. Diamond (p. 23) suggests that a developer can work on four major projects at once. His estimate is good enough. Assume only 400 courses. (Too few.) Assume each can be redesigned in a semester. (It takes longer.) One developer can work through the entire curriculum in only a half century – and eight of those courses will be up-to-date every year!

The anti-shotgunners stress major and lasting impact. They claim a few major projects will have greater impact than several small ones. This is not necessarily true. A few major projects each year will touch very few students who are not enrolled in the chosen areas. Worse, a few major projects each year will touch only a few faculty – even though each faculty member "touched" can be expected to reach *many*

students every year for many years. Successful instructional development should result in the training of the faculty/client to employ instructional development independently on at least a limited basis. The faculty/client may also be expected to communicate his success to his colleagues. Thus, the shotgun approach results in significant institutional impact through the establishment of a network of independent faculty members utilizing instructional development to improve instruction. The efforts of a single instructional developer are multiplied many times as each new faculty is taught to use ID for the improvement of instruction.

RESULTS OF SHOTGUNNING

At institutions where shotgunning is practiced, the ID emphasis often is upon teaching the faculty member the ID process rather than upon merely turning out an instructional product. Every effort is made to render the ID activity as palatable as possible. Since it is important for the faculty member to achieve a success at the end of his ID effort, the product is not ignored. Varying amounts of ID staff support and participation are provided according to the aptitude and needs of the individual faculty/client. As faculty growth is perceived, ID staff support is withdrawn, until the faculty/client is operating solo. Follow-up support is provided to encourage the faculty/client to initiate independent ID projects. Follow-up includes statements of recognition and provision of material and consultative support.

In a review of the literature on ID, Durzo (1976) indicates that this imparting of ID skills to faculty is not a rare procedure. "The majority of opinions offered suggests that a major goal of any successful program should be for faculty to become instructional developers in their own right." Interestingly, some of the problems that plague the ID house may be attributed to trying to make developers out of faculty members. For example, to see how one sort of mischief began we need look only at the title of Faris' (1970) article, "Faculty Development – Key to Instructional Development." Notice two things here in particular: 1) Faris subordinated faculty development to instructional development, and 2) Faris was suggesting a way to increase the effect of ID procedures by multiplying the number of ID practitioners. Maybe it is too simple an explanation, but a retrospective view offers the conclusion that you must have a tail before it can be used to wag the dog. Faris may not have been the first to use the term faculty development, but he has the dubious distinction of having pinned it upon the backside of the ID dog.

A second unfortunate effect of the widespread practice of transforming faculty members into competent instructional developers has been to obscure the potential contributions of students to the spread of instructional development.

THE ROLE OF STUDENTS IN ID

The greatest untapped reservoirs of labor and talent in the world are the pools of students on college campuses. By-and-large the student population is comprised of young adults bored with trivia and make-work. These impatient people are eager to turn their efforts toward activities that count. They want to work on projects that will improve the world – even the academic world.

As pointed out earlier, the instructional developer, working alone, can barely begin to develop all of the instruction on campus. Faculty members who become adept can multiply that effort, but there are several reasons why the faculty cannot be expected to do too much – even after they become accomplished instructional developers in their own right. The major obstacle to massive faculty participation lies in the prior overcommitment of their time.

Braden (1977) enumerated several ways that students can become involved in the ID process. Both faculty members and instructional developers can recruit them. Pay and/or academic credit may be involved, but participation is as much reward as most students will require. Once involved, the student has several unique contributions to make to Instructional Development: 1) He/she can frequently approach a faculty member, suggesting a development project, when it would be inappropriate for a developer to do so. 2) The labor of the student, which traditionally is devoted to busy work, is a convertible asset which can be used to save time and money. 3) The student is often the best judge of courses and instructional materials that need improvement. 4) Some faculty members, who won't work with an instructional developer, will work with students. (It is a safer relationship for the faculty member because he/she remains unthreatened and in control.) 5) Because students have limited time for ID participation, they necessarily will become involved in small projects. Also, students' interests reach into every academic discipline. In combination, these factors suggest that students are a strong potential asset to be used in dealing with the need to shotgun in those environments where shotgunning is economically a poor ID strategy.

When students are pulled into the ID process they provide a middle link between the more traditional ID team members. The presence of the student in the ID team softens the question as to who does the work that a faculty member would otherwise need to do. This is a

major enticement to gain faculty involvement in an ID project. If permitted, the student can do part of the project work of the instructional developer. Also, the student can do part of the production work on a project that is normally costly in terms of technician wages. Yes, the student can do all of these things and in so doing speed progress on the project.

Students can be brought into the ID process whether shotgunning is the practice or not. In fact, intern developers can play a significant role in a rigorous anti-shotgun system. However, schools that do not have strong instructional technology *teaching programs* are unlikely to be able to sustain an internship program for budding instructional developers. This leads to the conclusion that the greatest potential for student participation in ID is in shotgun approaches. This in turn leads to the observation that in many environments the students and the faculty members will be learning to do ID together. As faculty members become adept at ID, the student ID helpers of the future will in many cases completely replace the instructional developers of today — but we need not despair at that prospect. There will always be new faculty entering the stream, and in most places there will be more to do than people to do it. The developers won't be out of business. They will be trying to decide who to serve first, and, if the excess demand is overpowering, they may be trying to decide who not to serve at all.

PRIORITIES

A critical set of decisions in the establishment of an ID program turns upon the concept of *priorities*. The question is, will one client's project be given preferential treatment over that of another client? There are good arguments in favor of either a positive or a negative answer. The setting of priorities is a cornerstone of the anti-shotgun approach. That does not mean, however, that first-come-first-serve, the antithesis of selection-by-priority, is the trademark of every shotgunner. Even those ID programs which attempt to serve every faculty member who calls or drops by can offer differential support as long as the factors for selection are consistently applied. For example, subsidies to be applied against the fee-for-services charges of a media production facility can be allocated at the discretion of the developer.

In general, the shotgun ID shop should eschew the setting of priorities. One of the strongest arguments in favor of a shotgun ID approach is that it has the potential to serve *all* faculty who desire to improve their instruction. Any program which can offer such wide-ranging support makes up in atmosphere-for-change for many other deficiences. By contrast, programs which threaten to stifle creative ideas through selection-rejection processes have a chilling effect on some faculty members.

Even so, the world is not perfect, and it may become necessary for the developer to control the flow of work with some sort of priority system. Imagine, for example, the dilemma that would strike a small ID operation if the president of the institution suddenly linked raises in salary to ID activity! While this is obviously an example from a frustrated developer's fantasy life, it is also a concession to the unpredictable nature of events. In the final analysis, budget, or sickness, or unpredicted success, or any of dozens of things might make the decision to impose priorities a viable choice for any developer. The shotgun developer, however, may *still* have greater flexibility in the matter of priorities than his anti-shotgun counterpart.

DIFFUSION OF THE ID CONCEPT

Given the fact that instructional development is worthwhile, it seems important to communicate to the educational community the nature of ID and its benefits. Instructional development, while it has great potential for the improvement of instruction, will never realize its potential until a significant portion of the educational community is aware of its existence. Since a large segment of the educational community is lamentably unaware of ID, it would seem that a high priority goal of instructional developers should be the promotion of ID among educators. Such promotion would, of course, be best served by clear statements about the nature of ID and its benefits.

One might ask, "what are the professional associations and the recognized leaders doing to promote Instructional Development?" Unfortunately, the response seems to be, "they are talking to themselves." Too much of the literature advocates a particular approach, and too little presses for diffusion of the process in all acceptable forms. Naturally forceful individuals advocate specific approaches to ID that have proven successful in their shops. Because these individuals are forceful, their ideas receive a great deal of attention. They have become the spokesmen for instructional development. The problem arises when the leaders attempt to convince other instructional developers of the efficacy of their approach rather than convince educators of the need for ID. The instructional development movement suffers because the most powerful voices are directed internally, almost totally excluding efforts for the diffusion of ID among the greater educational community. The obvious recommendation of the authors is that the organization should be encouraged to devote more of its energies to promoting the profession and less of its energies to elitism and the trappings of professionalism.

CONCLUSION

The authors have raised some sticky questions and have attempted to lend some clarity to the issues challenging instructional developers. On some issues the authors have taken strong positions that are counter to those of the acknowledged leaders in the field. However, the questions remain; no issues have been settled. It remains for instructional developers to remember the questions, to study the issues, and to take positions relevant to their situations. It is tempting to call for a concensus on the issues, but we must all realize that the contingencies of reality make consensus unlikely. In fact, consensus and rigid adherence to any party line is not really desirable.

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CHAPTER XIII

INSTRUCTIONAL DEVELOPMENT: THE STATE OF THE ART

By

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Interest in technologized instruction in general, and in instructional development in particular, has increased greatly during the last several decades (Durzo[1]; Lumsden, 1975). The accountability movement of the late 1960's and early 1970's, begun perhaps by instructional developers themselves, has provided much of the sustaining impetus of the movement towards a science of instruction. Numerous institutions of higher education have moved to meet the learning needs of aspiring instructional developers by taking advantage of the large amount of federal support available for training programs in the field. It is probably safe to say that many of those in our field today are instructional developers because ours was a field receiving strong financial support at the very time today's professionals were considering doctoral work (Durzo).

Then, as now, the field was fraught with dissension regarding what type(s) of program(s) should "father" instructional developers. Should instructional developers be products of educational psychology departments with some emphasis on educational media and related areas, or should they be products of educational media departments with some emphasis on educational psychology and other related areas? Because there are sound arguments supporting each position, it seems appropriate and logical that both fields should train instructional developers, with federal support being provided to both types of programs.

Far more important than when, where, or why the move towards the use of instructional developers began is the fact that an increasing number of universities, community colleges, public schools, health education facilities, businesses, and industrial firms are employing instructional developers in key positions in their training programs.

The instructional development concept has gained credibility, but has done so without the benefit of a clear understanding within the ranks of our clientele or, as has been mentioned in earlier chapters,

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[1]Citation without publication date refers to previous chapters of this book.

without a clear understanding, even amoung ourselves, of the nature of instructional development (Davies and Schwen, 1971). It is clear that one task which must be undertaken right away is that of defining ourselves, using such concepts as instructional development, faculty development, curriculum development, organizational development, and educational development (Braden and Terrell; Silber, 1977a). We must, then, take whatever steps are appropriate to help our clientele understand the meanings of, and the interrelationships among, these concepts.

Professional organizations have taken notice of those involved in instructional development, and special interest groups are being formed around the country. The Association for Educational Communication and Technology (AECT), for example, is the parent organization of the largest and most influential of these special interest groups, the Division of Instructional Development (DID). In just a few years this division has become one of the most prominent of the special interest groups within the AECT.

Communication among instructional developers, both on a person-to-person basis and through written communication, has been a prime objective of DID. DID programs at the annual AECT convention have in the last several years been the largest, the most impressive, and the best attended sessions of the convention, with many outstanding speakers and numerous opportunities for interaction at all levels of instructional development. Thus, the need for increased face-to-face communication is being partly met at least for one week each year, but only for those who are able to attend the divisional meetings of the AECT convention.

The written communications problem has been a more difficult one to solve. The Division of Instructional Development began its written communications effort with the DID Newsletter, a quarterly publication presenting information concerning DID business matters. The need for more detailed information regarding specific ID activities fostered the "DID Occasional Paper" series; these were published as manuscripts and funds became available. This publication carried the burden of the professional ID communications effort. There were, of course, articles in other professional journals such as the *A V Communication Review*, *Educational Technology*, *Instructional Science*, and others; but no journal totally devoted exclusively to the field emerged until the *Journal of Instructional Development* was first published by DID in the fall of 1977. Although the inauguration of this journal signaled the coming of age of the Division of Instructional Development, it does not, in our opinion, solve all of our formal communication problems. Interest in, and professional involvement with, instructional development is more than adequate to support at least one additional journal in the field (Silber, 1977b).

INSTRUCTION OF INSTRUCTIONAL DEVELOPERS

Through its committee on certification, the Division of Instructional Development is presently attempting to deal with the processes of definition and differentiation affecting instructional, faculty, and organizational development. The committee is attempting to identify those competencies required of instructional developers, those tasks in which instructional developers are most frequently involved, and methods by which professionals might be trained to fill the instructional developer role. Although this is an essential and ambitious effort, and one which will go far towards furthering professionalization of the field, the effort will inevitably fail if the critical area of interpersonal communication skills is left unattended or ill-defined. Attributes of successful instructional developers in the interpersonal communications area must be observed and described. Appropriate efforts must be made to insure the incorporation of training in this area into all programs which purport to train instructional developers (Duncan; Lawrason).

Instructional developers are still being trained in academic programs which are associated with departments of educational media and with departments of educational psychology. Unfortunately, not all training programs are doing an adequate job. Many programs are graduating "instructional developers" who, in reality, are educational media specialists (in much the same way that libraries are becoming "learning resource centers" by means of a simple name change alone). Many programs are graduating "instructional developers" who are well trained in learning theory, but who have virtually no experience or training in the design and production of instructional materials. Many programs are graduating "instructional developers" who know the language of instructional development, but who are incompetent in real-life situations requiring the applications of practical skills. Many programs provide no opportunities for their students to engage in field experiences. Much effort, indeed, must be expended if these weaknesses in the profession are to be corrected.

INSTRUCTIONAL MATERIALS FOR TEACHING INSTRUCTIONAL DEVELOPMENT

Another problem associated with the preparation of instructional developers involves both the quantity and quality of instructional materials available for use in the teaching-learning process (Colton). Our exposure to available instructional materials has revealed many excellent single units which can be effectively utilized in the instructional process, but we have not been able to locate any packaged materials which can do the complete teaching job alone. Most materials we have evaluated use either the written format or follow the audio-visual approach, but do not include both in significant amounts. Most materials take a philosophical or textbook approach to instructional

design, but contain very few practical instructions concerning how to actually carry out the instructional design process.

One instructional system with which the authors are familiar, *Learning Systems Design* (Davis, *et al.*, 1974), makes an attempt to provide a multi-media approach to instructional development using a combination of printed materials, filmstrips, and audio tapes. We found the text to be excellent and well-liked by students. But we found the filmstrip and audio tape portions to be of far less value. Only a few of the filmstrips and tapes significantly enhanced student learning, and apparently little care was given to controlling the quality of their production.

The teaching of a course in instructional development at the University of Florida has necessitated the integrated use of the following materials in order for the students to attain criterion performance:

1. A text; *Learning Systems Design* (Davis, *et al.*, 1974);
2. Portions of selected filmstrips and audio tapes from *Learning Systems Design* (Davis, *et al.*, 1974);
3. Portions of the filmstrip-audio tape series, "Designing Effective Instruction" (General Programmed Teaching, 1970);
4. Portions of filmstrips, audio tapes, and printed materials from "Criterion Referenced Instruction" (Mager, 1974);
5. Portions of "Teacher Competency Development Systems" (Prentice-Hall, 1973);
6. References to such works as:
   (a) *Systems Approach For Education* (Corrigan Associates, 1971);
   (b) *Systems Engineering of Training* (U.S. Army, 1972);
   (c) *Job Training Course Design and Improvement* (Rundquist, 1970); and
   (d) *Handbook for Designers of Instructional Systems* (U.S. Air Force, 1973).
7. Oral presentations (delivered by the course instructor and guest lecturers) on the practice of instructional development; and
8. Supervised field experiences.

PLACEMENT IN ORGANIZATIONAL STRUCTURE

What types of jobs are trained and credentialed instructional development graduates likely to receive? The answer is that these jobs are extremely varied (Bratton; Druzo).

In universities three patterns seem to be emerging. First, individual schools and colleges are employing instructional developers to serve their entire unit. Second, central units are employing instructional developers

to serve the entire university. Third, many universities are employing both approaches.

In junior and community colleges the patterns are similar to those in universities. The most common pattern is that of a central unit serving the entire college. Generally this unit is associated closely with the office of the academic dean and in some cases, in order to add power to the position, the director of the instructional development unit is given the title of Associate Dean for Instructional Development. In some schools there is a movement toward the employment of instructional developers within each department. These developers are usually faculty members with subject matter expertise that is appropriate to the department and instructional development skills.

In the few cases where instructional development has been utilized in any formal sense in the public schools, it has been applied on an individual school basis and has generally been the charge of the vice-principal for curriculum or instruction.

Within business and industry, instructional developers are typically employed in the capacity of training officers serving the entire company or specific corporate divisions. These instructional developers are responsible for both product and staff development at all levels of organizational training.

FUNDING

The funding patterns for instructional development activities are somewhat perplexing to us because the advancement of instructional development may be conceived as a task involving the diffusion of innovations. Yet in most instances, none of the funding practices appropriate to diffusion are being employed (Durzo). If an innovation is to be promoted, several conditions are important to its diffusion and assimulation (Rogers and Schoemaker, 1971). Not the least of these conditions are the relative worth of the innovations when compared with what they are changing, improving, or replacing.

In those institutions in which clients must pay for their instructional materials, these two critical conditions remain, more often than not, unfulfilled. Furthermore, this applies even to those schools in which the time of the instructional development specialist is provided without charge. What is needed is a sufficient commitment on the part of the institutional administration to the concept of the systematic design of instruction and confidence in the instructional developer. Within reason, financial support should be provided for whatever materials (innovations) are required in order to provide the best possible instructional systems for the students being served.

Another funding problem affecting instructional development involves the use of federal funds (Bratton). Federal funds are available for the initial development of materials, but they are generally unavailable for the later redesign and further validation of the materials. The federal government should either provide funding for the entire process of the systematic design of instruction, or it should require that the agency to which the grant is awarded commit itself to the completion of the process originally undertaken with federal "seed" money.

IMPACT AND THE FUTURE

At this point it seems appropriate to address issues affecting the future of instructional development. And there is at least one issue which will remain central to our work as long as we remain a professional group. The issue concerns the impact of what we are doing. We can improve product design. We can improve the match between personality characteristics of the student, the faculty, and instructional materials. But unless the actual practice of instruction is significantly effected by what we do, all our improved technology is virtually worthless (Hoban, 1974; Braden and Terrell).

It is important that we be clear concerning the nature of impact. Impact implies effect. An object, or process, has impact upon some other object or process if it produces an effect (a change) upon that object or process. This effect may, of course, be either beneficial or deleterious. The effect may be in the form of a change, or it may represent a maintenance of the status quo in a situation in which there would otherwise be a change. In each of these instances there is impact.

The achievement of impact has been central to most of the discussions included in the present volume. Impact is central to the arguments of Braden and Terrell. The measurement of impact is central to the work of Bratton and Durzo. Abedor and Sachs have examined some of the strategies for achieving impact. And Wilson, Colton, Osterman, Duncan, and others have gone to great lengths to identify and explore ways by which our impact as instructional developers may be increased. Impact, then, is clearly central to the advancement of our profession.

CONSIDERATIONS IN A THEORY OF IMPACT

The full development of a general theory of impact is indeed an ambitious, but essential, task. Therefore, we should be at least aware of certain salient elements of such a theory insofar as these elements influence the impact our profession is potentially capable of making.

These elements appear to include the following (Weissenberg, 1971):

1. An educational system normally exists as a balanced conglomerate of forces;
2. As long as these forces remain in balance, no impact can occur; the system is in a steady-state condition;
3. Any change in one or more of these forces results in an unbalanced system; and
4. The elements of an unbalanced system always attempt to reach a state of balance; they do not usually attempt to return to the original state of balance, however, but reach the "easiest" position of balance possible.

In order to achieve impact, then, an element must produce an effect within the system while the system is in a state of imbalance or while it is becoming imbalanced. This can be done in any one of three ways (Smith, 1969):

1. The element can assist the system in maintaining its original state of balance, by resisting the forces tending to produce change;
2. The element can assist an imbalance to occur by adding to those forces already tending toward the production of the imbalance; and
3. The element can assist in the re-establishment of a system-wide balance within some new configuration.

Within the more limited context of small group interaction, Kurt Lewin has called these three types of action *unfreezing, changing,* and *refreezing* (Cartwright and Zander, 1953).

PRESENT STATE OF THE AMERICAN EDUCATIONAL SYSTEM

The question facing us today is whether or not the American educational system is in a balanced or unbalanced state. A related question is whether or not instructional developers can effect, or have impact upon, this condition of balance or imbalance. Another way of stating the question is to ask whether or not there are identifiable phenomena which are tending to alter the nature of the American educational system, and whether or not we can restrain changes we consider undesirable or facilitate changes we consider desirable.

Clearly there are many forces, both internal and external to the American educational system which are tending to modify it. A few of these forces of change include the increasing costs associated with education (Mandell, 1977), decreasing achievement of students on national achievement tests (Savage, 1978), increasing social turmoil in our schools *(Time,* November 4, 1977 and January 23, 1978), the decrease in authority of

teachers over their students, and an increasing understanding of the processes of education among psychologists, anthropologists, and sociologists. All these forces are tending to bring about changes in the balance of forces operating in the educational system. Some of these changes may be viewed as desirable, whereas others may be seen as undesirable (Fantini, 1977; Swan, 1977; *Time*, January 9, 1978).

ESTABLISHING A NEW EQUILIBRIUM

If instructional development programs are to achieve a greater impact in the future than they have in the past, they must assist the educational system to reach a new equilibrium, one in which the various forces tending toward imbalance are balanced again. But before instructional development programs can achieve much in the way of balancing these forces – or of unbalancing them in productive ways – certain conditions must be met:

1. We must know how to solve the problems presented by the forces we wish to effect;
2. Those who occupy key positions within the system must be aware of our proposed solutions;
3. These key people must view our solutions as the ones of choice;
4. These people must make available to us the resources we need to implement our solutions; and
5. These key people must give us the additional support (material and non-material) we need to enable us to implement and maintain our solutions.

If we examine the current state of instructional development in terms of each of these five conditions, we can see at least in outline form the emerging future of our profession.

INSTRUCTIONAL DEVELOPMENT SOLUTIONS TO EDUCATIONAL PROBLEMS

Does instructional development have solutions to the problems confronting today's educators? In many instances, yes. For example, Osterman, Colton, Thiagarajon (1974), and Basco (1976) have rather clearly demonstrated this. We have available today a technology of instruction which has been refined over and over in various situations so that now we know that it is effective.

Equally clear, however, is the fact that this technology has achieved only a limited impact compared to the potential impact it is capable of making (Oettinger and Marks, 1969). It has had little effect, if any, upon educational systems outside the university, the military, and the

community college. Even within these systems, the impact of instructional development has been quite limited. Why is this? Parly because we still do not know how to design effective learning materials for use in all possible types of educational settings. We do not know how to design effective learning materials for pre-school children. We do not know how to design effective materials for the achievement of cognitive and moral developmental stages as conceived by excellerating Kohlberg (1972) or Piaget (Pulaski, 1971).

There is no valid reason to believe the claim (put forth by Kohlberg and Mayer (1972) and others) that our lack of impact is rooted in a basic deficiency in the conceptual underpinnings of our technology. Rather, the reasons are much more likely to be found in our failure to thoroughly satisfy the five conditions listed above.

Most educators today are unaware of the solutions we can offer. They are perhaps even more unaware of our technologies for generating new solutions (Duncan). On the university level this manifests itself in a belief that there are good and poor students, and that poor students are so because they either don't apply themselves or they aren't bright enough to master content. Thus on the university level there is a wide-spread belief that a technology which can significantly improve teaching does not exist, or that such improvement is not needed even if it does exist since it will only benefit those who should not be in college in the first place (Bratton).

On the elementary and secondary levels even fewer educators are aware of what instructional development has to offer. One of the reasons for this might be found in the almost total absence of instructional development programs operating within elementary and secondary schools. Another reason might be that curriculum development has only recently been considered a function which should occur locally (Taba, 1962). In fact, courses in instructional development are typically not required as part of teacher preparation programs in most universities. Most undergraduate courses in educational technology are, in reality, courses restricted to the teaching of simple production techniques and the selection and use of commercially-produced materials. Too often the funds needed to support instructional development have been available only in post-secondary settings and in private industry. The few exceptions to this provide notable examples of our potential, but they affect few people and produce little impact upon the public schools in general. The exceptions do, however, provide models which should be examined for clues to direct us in future activities within these educational settings.

There is today within the ranks of the educational profession a rather hostile opposition to instructional development as well as to any other form of technology which might be applied to education. Many

educators dislike computers, behavior modification, mastery learning, and behavioral objectives with equal passion. We have yet to find ways of neutralizing the resistance of these educators. Until we do, they will remain a strong force opposing our efforts to produce impact (Jackson, 1966).

PRESENT PROBLEMS

Resources for instructional development are far from adequate. We do not have enough trained instructional developers to do the job that needs to be done even if we limit our efforts to university, military, and industrial situations. Many of the major contemporary problems in the field of instructional development center around the paucity of resources, human and otherwise. It is clear that our ability to impact is being severly limited. We must become innovative in the use of our present limited resources if we are to achieve our potential impact (Gustafson, 1977).

Bratton reports a trend toward the utilization of instructional development personnel who have no formal training in the field. A second trend related to resources is also reported by Bratton. He reports that many institutions have dropped their instructional development programs and that many other programs have had their budgets severely cut. As pointed out earlier, federal funding seems to be directed mainly towards the establishment of new programs with seemingly little concern as to whether they continue to exist over time. Other sources for the maintenance of on-going programs are difficult to identify and seem to be less reliable today than in the past. More than ever before we must convince administrators and the lay public of the value of our technology and of the necessity for trained personnel to implement it (Bratton). Like it or not, we who call ourselves instructional developers must begin to see ourselves as salespersons, too.

Cutbacks in funds are due not to the failure of our technology, but to an attitude on the part of administrators that instructional development is a luxury, a frill which in hard times is too expensive to be maintained (Bratton. Instructional development is more often than not the last to be hired and the first to be fired. Only we can change this deplorable situation. And if we fail to do this, we will not only be dispensable; we, ourselves, will very likely be dispensed with.

Our situation is particularly precarious with respect to the fifth condition. Several forces exist within the educational community which either diminish or potentially diminish the support we receive. Unfortunately, we function today only at the sufferance of the faculty (Kerr, 1977). And there is always the danger that administrators will use our technologies as weapons against their faculties. Many faculty

members in fact do perceive our technologies as the tools of administrator intimidation (Bratton).

Collective bargaining in education, the result of faculty-administration interaction, poses a potential threat to the general advancement of instructional development (Schaffer; Davidson, 1971). Either out of fear or lack of consideration, possible innovations can be seriously hampered through provisions of union contracts which have, on the surface, nothing to do with instructional development (Perry, 1977; Mesgill and Mesgill, 1971; Eiken, 1977).

Needed support is lacking in other more fundamental ways. We are not expected, or allowed, to carry out long-term evaluations of most of our instructional development activities. Sometimes even short-term evaluations are not possible. Consequently, many of our developmental activities become "one-shot affairs", and their outcomes cannot be presented as demonstrations of our potential. Our potential is actually lessened under these conditions, since neither project revisions nor process improvements are possible. Adequate evaluation data are simply not available (Baker, 1977).

Also, risk-taking is not encouraged, either for the instructional developer or for his clients (Oettinger and Marks, 1969). But instructional development as we know it is essentially an empirical process. It can only flourish in an atmosphere where bold experimentation is allowed. Such experimentation can occur only where failure does not endanger either the overall instructional development program or the personal careers of the instructional development staff. Certainly no faculty member is going to attempt something he doesn't have to if doing so increases the likelihood that his promotion or tenure will be adversely affected (Perry, 1977).

According to Bratton, instructional development programs at different institutions do not lend each other adequate mutual support. A network for the exchange of information and products is needed (Dixon, 1978). A network of this sort could facilitate inter-institutional cooperation considerably. Some cooperation and information exchange admittedly takes place now. However, it occurs only sporadically and through personal contacts usually at conventions.

Our own profession, regrettably, provides inadequate support for our programs. Educational technology has yet to decide whether it exists primarily to nurture innovations or to support the traditionally-based classroom operating on the "cottage industry" model. Much of the field of instructional development has remained service-oriented (Kerr, 1977). This implies, among other things, an orientation which says that to get along we must go along. Ours is that branch of education which deals with technology, but its manner of doing so leaves much to be desired. Our field is not normally one which originates

and promotes changes, but one which services those changes initiated by others. This posture places us in the roles, not of change agent or pacesetter, but follower and perpetuator of the status quo. As a professional group, we often appear to be disinterested in providing technological solutions to the problems of those who have not yet learned to come to us for assistance. Until we begin to provide these services and solutions, we will not achieve our full potential impact.

Within the ranks of our profession, much of the energy which could be useful in supporting institutional instructional development has been dissipated in in-house bickerings over the details of organizational structure. This sort of hassling has undoubtedly reduced our impact upon the processes of education (Terrell and Braden; Gustafson, 1977).

THE FUTURE OF THE INSTRUCTIONAL DEVELOPMENT MOVEMENT

What, then, can be said about the future of the instructional development movement? The movement will continue to expand its influence and increase its impact within the educational community, or it will be considered by the rest of that community to be expendable (Hoban, 1974).

We must incorporate the findings of developmental psychology, behavioral psychology, moral education, interactive instructional design, and other innovative developments into our expertise. As this occurs, we will be able to exert an increasingly greater influence upon the preschool and elementary area of education (Wilson; Kohlberg and Mayer, 1972).

We must cease in the future to be mere service providers. We must become true innovators in our own right, developing ways of introducing innovative technologies to those professionals and students who can benefit from them (Hoban, 1974). Our ultimate commitment is not to the teacher or to the administrator, but to the student (Braden and Terrell). This fact should cease to be a purely academic consideration and should begin now to influence the way we design learning systems (Kaufman, 1977). We can no longer afford to wait idly until the world beats a path to our doors for help. We must, in the future, find new and better ways to improve the educational system wherever the system needs improvement. More and more of the leadership required to do this must be assumed by us.

We must begin to take the necessary steps to educate the general public and the professional educational community concerning our potential to be of service (Gustafson, 1977; Educational Technology Staff, 1967).

We must, as Terrell and Braden have pointed out, educate more classroom personnel in those instructional development techniques which they themselves can use.

Organizations such as AECT must, in the future, become increasingly united behind goals related to the diffusion of technology in general and instructional development in particular. AECT must devote a greater part of its energies to promoting educational change (Gustafson, 1977).

We must promote risk-taking projects which represent pioneering efforts in the application of technology to education. We must not hide our failures; in fact, more of our failures should be publicized in our journals. Reading today's journals one gets the distinct impression that everything we do is a table-thumping smash, an unqualified success. But we ourselves know better (Bratton; Oettinger and Marks, 1969), and we must realize that failures provide knowledge which can lead to later success.

In summary, we must:

1. Create new solutions to old problems in all areas of education;
2. Create an expanding awareness of our potential throughout the educational and lay communities;
3. Demonstrate to those who are already aware of our potential how that potential can be used to their advantage;
4. Ensure that resources are available for long-term, high-risk activities, for evaluation, for research, and for the in-service "cross-training" of professionals from other specialities and disciplines; and
5. Educate those who control our institutions and our profession in those skills, duties, and roles which they must exercise on our behalf if we are to achieve our potential impact.

These, then, are some of the things we must do in the future if we are to achieve that full measure of impact which we are capable of achieving. We feel that we have the courage and the determination to take the steps necessary to increase the impact of our technologies upon the educational world. If we do take them, we see a bright future for instructional development and the whole of education.

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